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Investigation of the Association Between Attendance in Preschool Programs and
Achievement of Elementary School Students in Greeneville, Tennessee

A dissertation

presented to

the faculty of the Department of Educational Leadership and Policy Analysis

East Tennessee State University

In partial fulfillment

of the requirements for the degree

Doctor of Education

by

Anita Marie Conner

May 2008

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Dr. Louise MacKay

Keywords: Assessment, Accountability, Curriculum, Early Childhood Education, Preschool,
Universal Prekindergarten

ABSTRACT

Investigation of the Association Between Attendance in Preschool Programs and Achievement of Elementary School Students in Greeneville, Tennessee

by

Anita Marie Conner

The purpose of this study was to determine if a difference in achievement test scores exists between students who attended preschool and those who did not as measured by standardized achievement test scores of students in the 3rd and 4th grades. The variables of grade level and gender were also considered. The population consisted of students who attended 4th and 5th grades during the 2007-2008 school year in the Greeneville City Schools. Data gathered were from Tennessee Comprehensive Assessment Program achievement test scores obtained from the 2006-2007 school year. Analysis of variance was used to identify any relationship between variables.

The investigation of the relationship between attendance in preschool and achievement test scores might assist educators in planning the implementation of future preschool programs within the public school setting. Although the information gleaned is specifically beneficial to Greeneville City Schools, other school systems seeking information on the relationship between attendance in preschool programs in relation to achievement test scores might find this study to be of importance.

Findings in this study did not show significance of preschool attendance within the Greeneville City Schools in relation to achievement test scores. Scale scores were tested in this model for both 3rd- and 4th-grade achievement scores. These scores consisted of language arts, math,

science, and social studies. All areas tested were found to have no significance for (a) gender, (b) attendance in a preschool program, and (c) interaction between gender and attendance in a preschool program within the Greeneville City Schools.

DEDICATION

This study is dedicated:

To my husband, Victor, for his patience, love, and support in allowing me to follow my heart and dreams. Because of him, I am a better person.

To my sons, Cameron and Colbie, who have loved me despite my absences. They are my true salvation.

To my friend, Claire Carter, who has encouraged me throughout my educational endeavors. Her friendship and countenance is unforgettable.

To my grandfather, the late Wade Ballard Dennis, who was a positive role model for my educational quest. I will never forget his love of knowledge.

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CHAPTER 1

INTRODUCTION

With a growing number of mothers entering the work force, the need for out-of-home childcare has increased dramatically in the last 2 decades. The Child Protection Law Report (2006) stated preschool funding was almost \$3 billion nationally with only nine states lacking publicly funded preschool programs. According to the Child Protection Law Report, the Pew Charitable Trust Yearbook showed 11 states with preschool enrollment declines in 2005 and a national reduction in per-pupil funding with a 7.5% increase in total expenditures. Only Arkansas met all of the National Institute for Early Education Research (NIEER) benchmarks for quality programs and only five other states met 9 out of 10 benchmarks. The General Accounting Office Strategic Plan (2003) stated that preschool was a developmental period where early investment might lead to a child's long-term intellectual language growth with most of the spending focused on children from low-income or at-risk families.

New federal initiatives have been emphasizing the importance of helping all children develop school readiness skills including early reading skills. However, the effect of early childhood programs on helping children prepare to enter school are still being debated (General Accounting Office Strategic Plan, 2003). In 1990, the National Education Goals Panel created by then-President Bush and the 50 governors set a goal that by the year 2000 all children would start school ready to learn. Evidence has been mounting that the early years are significant to children's later academic success (Schumacher, Irish, & Lombardi, 2003). Because kindergarten can be such an important beginning educational experience, the United States has currently been evaluating where it stands with respect to one of the eight national educational goals: "By the year 2000, all children in America will start school ready to learn" (Austin, 2005, n. p.). The call for education improvements has intensified with the passage of the *No Child Left Behind* Act of

2001, in which federal government has raised expectations for all children's achievement including children from disadvantaged backgrounds (Schumacher et al.).

Statement of the Problem

The purpose of this study was to determine if a difference in achievement test scores exist between students who attended preschool and those who did not as measured by standardized achievement test scores of students in the third and fourth grades. The variables of grade level and gender were also considered.

Research Questions

The following questions served as focal points of the study:

Research Question #1: Are there differences in third-grade achievement test scores for language arts, math, science, and social studies based on (a) gender, (b) attendance in a preschool program, and (c) interaction between gender and attendance in a preschool program?

Research Question #2: Are there differences in fourth-grade achievement test scores for language arts, math, science, and social studies based on (a) attendance in a preschool program, (b) gender, and (c) interaction between gender and attendance in a preschool program?

Significance of the Study

In the current age of accountability, educators must ensure that the strategies and interventions they employ are effective. Prince and Howard (2002) stated:

As evidenced by previous statistics, millions of American children are living in poverty. While much debate continues throughout the country about the education, or lack of education, all children receive, the situation for America's poor is by far more serious. (p. 3)

Prekindergarten education for disadvantaged children has often been considered to increase greatly their cognitive abilities, leading to long-term increases in achievement and school success (Prince & Howard).

The Greeneville City school system has recently placed emphasis on improving the achievement of children from disadvantaged situations by implementing a preschool program at each of the four elementary schools within the school system. There is also a preschool located at the Center for Technology that serves Greeneville City school students.

During the 2000-2001 school year, the Greeneville City school system aggressively pursued partnerships and funding to expand preschool services for at-risk children in Greeneville. According to the Greeneville City school system's Goals 2000 Preschool Grant, the need for adequate preschool education has been nationally recognized. In addition, according to the grant proposal, it was noted that then-U.S. Secretary of Education, Richard Riley, in his address to the Early Childhood Summit, stated that because of current findings in brain research and reading readiness, it was imperative that focus be placed on the early education years (V. Kirk, personal communication, March 17, 2004).

The Greeneville City school system's vision has been that all children will learn the essentials for happy and productive lives. This is supported by their slogan "be champions for children" and by the board's goal to "continue emphasis on meeting the early childhood needs of young children" (Greeneville City School System's Goals 2000 Grant, see Appendix B).

Prior to the 2005-2006 school year, only three preschool programs were offered within the Greeneville City schools: one at Highland Elementary School, one at the Center for Technology, and another housed within the Greeneville City school system's central office. At the beginning of the 2005-2006 school year, enough grant money became available from the state of Tennessee to incorporate a preschool program at each of the four elementary schools: Highland Elementary, Tusculum View, Eastview, and Hal Henard. In addition, there continues to be a preschool program housed at the Center for Technology that enrolls future Greeneville City school students. Each preschool program houses 20 students. In each classroom, there is one teacher and one assistant per 20 students. The criteria for entering a Greeneville City Schools program are based on income of parents, IQ scores, family demographics, and Brigance Screenings. At the first of each school year, preschool teachers are required to visit the home of

each student to be served. Furthermore, the teacher is required to visit each student's home two more times during the school year. Parents are required to attend a meeting with the preschool teacher on the first day of school to receive general information regarding the program and its requirements. A detailed description of the grant is presented in Chapter 3 and a copy of the grant is located within the Appendix section (see Appendix B).

This study should provide useful information regarding the implementation of preschool programs and their effect on achievement test scores. Information gathered over a period of 5 years could offer insights into the associations between preschool implementation and achievement levels for children at different grade levels and for boys as well as girls. Data collected over a 5-year period are likely to make the results of this study useful. While the information gleaned should be beneficial specifically to Greeneville City schools, other educators from school systems seeking information on the associations between preschool attendance and student achievement could also find this study constructive, especially when viewed in conjunction with the existing body of literature.

Definitions of Terms

1. *Achievement Tests*: "An assessment that measures a student's currently acquired knowledge and skills in one or more of the content areas common to most curricula (i.e., reading, language arts, mathematics, science, and social studies)" (Teacher's Guide to TerraNova, 1997, p. 293).
2. *Early Childhood Education*: "This is a term frequently applied to the education of young children from birth through age 8" (Bredekamp, Knuth, Kunesch, & Shulman, 1992, p. 1).
3. *Early Childhood Intervention*: "The provision of educational, family, health, or social services in the first 5 years of life to children at risk of poor outcomes due to socioenvironmental disadvantages or developmental disabilities" (Reynolds, Temple, & Ou, 2003, p. 634).

4. *Curriculum*: “(1) a set of goals and objectives for the content knowledge, skills, behaviors, and attitudes to be promoted; (2) a set of benchmarks for guiding and assessing incremental progress toward attaining these goals and objectives; (3) a repertoire of strategies that adults can use in a dynamic and flexible manner to intentionally structure environments and interactions to meet curriculum goals; and (4) supporting materials to facilitate the implementation of those strategies” (Welch-Ross, Lopez, & Boyce, 2002, n. p.).
5. *Scale Score*: A score by which raw scores are converted by numerical transformation (e.g., conversion of raw scores to percentile ranks or standard score); units of a single, equal-interval scale that are applied across levels of a test (Literacy TentWiki, 2006).
6. *Prekindergarten-3 (P-3) Continuum*: An educational experience that begins at the age of 3 and carries through to age 8 (Maeroff, 2003).
7. *National Institute for Early Education Research (NIEER)*: This is an organization that supports early childhood education initiatives by providing objective, nonpartisan information based on research (National Institute for Early Education Research, 2006, ¶ 1).
8. *Tennessee Comprehensive Assessment Program (TCAP)*: Students in grades three through eight take the Tennessee Comprehensive Assessment Program (TCAP) achievement test each spring. The achievement test is a timed, multiple-choice assessment that measures skills in reading, language arts, mathematics, science, and social studies (Merit Software, 2007).
9. *National Assessment of Educational Progress (NAEP)*: The NAEP reports information about the nation and specific geographic regions of the country. It includes students drawn from both public and nonpublic schools and reports results for student achievement at grades 4, 8, and 12. This is also known as “the Nation’s Report Card” (National Center for Education Statistics, 2008).

Delimitations

This study was delimited to the following characteristics: The population consisted of students who were third or fourth graders during the 2006-2007 school year who attended the four elementary schools in the Greeneville City school system. The study focused on those students who were in attendance in the fourth and fifth grades during the 2007-2008 school year. During the period for which data were collected, students either received preschool instruction or did not receive preschool instruction as determined by a survey given to parents.

Overview of the Study

This study is organized into five chapters. Chapter 1 provides an introduction, a statement of the problem, research questions, the significance of the study, pertinent definitions, and delimitations. Chapter 2 presents a review of the literature and is organized into the following sections: historical perspectives, application of theories, curriculum development, teacher training, assessment and accountability, community and parents, program participations and statistics, preschool limitations, universal preschool, and a summary. In Chapter 3, the research methodology is detailed. Information is provided on the research design, the population, student achievement, a description of Greeneville City school system's implementation of preschool programs, as well as a description of curriculum, data collection, and analysis. Chapter 4 provides an analysis of data. This chapter contains a description of the population, student achievement, and a summary of findings. Chapter 5 presents the summary of the study and a summary of the findings, conclusions, and recommendations for future study.

CHAPTER 2

REVIEW OF RELATED LITERATURE

This chapter provides a review of the literature relevant to attendance in preschool programs and is divided into 10 sections: (a) historical perspective, (b) application of theories, (c) early childhood studies and effects, (d) state funding and benchmarks, (e) curriculum development, (f) teacher training and experience, (g) assessment and accountability, (h) community and parent collaboration, (i) basis for preschool programs, (j) limitations of preschool intervention, (k) universal prekindergarten, and (l) a summary.

Historical Perspective

Daycare was an invention of the 19th century--a response to the immigration that brought over five million families to the United States between 1815 and 1860 and to the industrialization that took women who needed to work away from the home and into the factories. Although the origin of the idea of caring for young children in groups was somewhat obscure, according to Roby (1973), most agreed that the French *crèche* was the model for the American day nursery. *Creches* were designed to reduce the high death rates of infants whose mothers worked in French factories during the early 1900s.

As pointed out by Roby (1973), the first U.S. day nursery was opened in Boston in 1838 by Mrs. Joseph Hale and it provided care for the children of seamen's wives and widows. In 1854, the Nurses and Children's Hospital in New York City opened its version of the day nursery to care for children of working mothers who had been patients. Two women from Troy, New York visited the hospital nursery, liked the idea, and opened their own nursery in 1858 (Roby).

During the Civil War, the children of women who worked in hospitals and factories in Philadelphia were served by a nursery that opened in 1863 (Roby, 1973). According to Roby, a

model day nursery was set up in 1893 at the World's Fair in Chicago and cared for as many as 10,000 children who were visitors. By 1898, around 175 day nurseries were operating in various parts of the country, enough to warrant the creation of a National Federation of Day Nurseries (Roby).

Daycare programs were (and still are) specifically designed to serve those children whose parents could not be at home to care for them. During the year 1899, in New York City, 15,000 children were turned over to orphan asylums at a cost of over half a million dollars, a practice that led social agencies to recommend day nurseries as a more humane and less costly method of child care (Roby, 1973).

According to Roby (1973):

The first White House Conference on Children and Youth, held in 1909, heralded home life as the highest and finest product of civilization, and urged that children be cared for in their homes whenever possible. The conference recommended mothers' pensions as a substitute for day nursery care, and by 1913, 20 states had enacted laws authorizing financial assistance to indigent mothers. (p. 159)

Hymes (1969) stated that 1922 has generally been considered the U.S. nursery school's birth date with the opening of Ruggles Street Nursery School of Boston, Harriet Johnson Nursery School in New York City, and Merrill-Palmer Nursery School in Detroit. Hymes also noted that in the depression years of the 1930s, the federal government allocated funds for what were called the Emergency Nursery Schools and then, later, the Works Progress Administration (WPA).

In the late 1930s and as the U.S. economy improved, the WPA nursery schools closed; their place was soon taken by Lanham Child Care Centers and funded by the next massive federal expenditure on group programs for young children (Hymes, 1969). Hymes pointed out that the crisis years of the 1940s during World War II was the second "booster shot for the early childhood education movement" (p. 6).

In 1965, through the War on Poverty, early childhood education received its third and brightest exposure on the national scene. The occasion was the advent of the Head Start program. In January of 1965, there was no Head Start program, not even on paper; but by July of 1965, more than one-half million young children--580,000--were in 6-, 7-, or 8-week summer

Head Start programs. The summer Head Start program suddenly blossomed into being labeled by one author as the third largest and the most impressive national spotlight ever put on early childhood education (Hymes, 1969).

Hymes (1969) stated:

Head Start began as an activity of the Office of Economic Opportunity. It came into being because of the realization that, despite America's seeming affluence, about one-fourth of our young children lived in bleak, barren, impoverished conditions that made it difficult—often impossible—for their homes to provide all the experiences that add up to a good start to life. (p. 7)

Much of the public's increased awareness of prekindergarten education has arisen from the federal government's efforts in this field. Since 1966, the Educational Policies Commission has supported the availability of public educational programs for all children beginning at age 4. Educational Research Service (1976) stated:

Additional backing for public prekindergarten programs has come from various professional organizations in the field of education, including the American Association of School Administrators, the National Association for the Education of Young Children, the National Education Association, and the American Federation of Teachers. (p. 2)

Educational programs for children of prekindergarten age have both staunch supporters and vehement critics. Those favoring the establishment of prekindergarten programs often centered on the educational importance of the early years and the need to avoid wasting these years. Supporters have emphasized the fact that prekindergarten programs could offer intellectual stimulation as well as provide a good basis for the social, emotional, and physical development of children. As noted by Educational Research Service (1976), such programs were particularly necessary for disadvantaged and handicapped children. On a purely pragmatic basis, supporters of preschool programs cited the necessity of supplying sound educational experiences for those children who could not be cared for at home because of an increase in the number of working mothers and the changing role of modern women (Educational Research Service).

Early childhood interventions from birth to the early school grades have received widespread attention as effective ways to prevent learning difficulties and to promote children's

wellbeing. Preschool programs have been the centerpiece of many school and social reforms nationwide and expenditures for them have exceeded \$20 billion annually (Reynolds et al., 2003).

Theories Applied to Early Childhood Curriculum

As noted by Lavatelli (1970), Psychologist Jean Piaget contended that the period of early childhood was when proper intervention would have its maximum impact upon the development of intelligence. Piaget's theory was a developmental one. Thinking processes change during childhood, and the thinking of a 4-year-old is qualitatively different from the thinking of a 14-year-old. Piaget described such changes in age-related stages. Based on Piaget's theory, one reportedly could predict the thought processes of children within a certain age range (Lavatelli).

Langford (1989) stated that according to Piaget, the development of children's thinking was divided into three main stages. First was the sensorimotor period from 0 to 2 years. During the sensorimotor period, the infant learns to coordinate movements, pick things up, throw them, prod them, crawl, walk, run, stack objects on top of others, and recognize a wide variety of situations.

The next stage as reported by Langford (1989) was that of concrete operations lasting from age 2 to age 11. This stage was divided into two main substages: the preoperational period from 2 to 7 years and the substage of concrete operations from about age 7 to age 11. In the preoperational period, the child learns the use of language and symbols and begins to reflect upon experience and knowledge that earlier were "closely tied to action" (p. 3). According to Langford, the substage of concrete operations begins with two major achievements: the child learns how to relate the parts of a collection of objects to the whole and begins to understand "conservation of number" (p. 3). When in the substage of concrete operations, the child is able to consider the possible results of actions that have not actually been carried out. Thus, in learning to do arithmetic, the child comes to understand that if he or she takes a collection of

three objects and adds it to a collection of five objects, he or she will get a collection of eight objects (Langford).

In the stage of formal operations, from 11 years onward, Langford (1989) stated that adolescents begin to be able to understand a number of concepts that they were unable to appreciate beforehand. Among those were ideal constructions that could “never be produced by human actions, skills relating to the design and interpretation of experiments, and a number of more complex mathematical ideas such as those of functions involving multiplication and division, proportions, and systems of possible combinations” (p. 5).

Lavetelli (1970) stated:

For Piaget, equilibration has been the key factor in explaining why some children advance more quickly in the development of logical intelligence than do others. He did not discount such factors as maturation, but he did not find them sufficient. He pointed out that we couldn't anticipate that children, by virtue of having reached a certain age, have reached a certain state in logical development. (p. 37)

According to Lavatelli (1970), two mechanisms were important in equilibration: assimilation and accommodation. Assimilation should occur each time an individual incorporates into his or her own mental framework the data from an experience. However, in assimilating an object or a situation, one must act upon it and transform it in some way. Lavatelli explained, "Accommodation presupposes effort and initiative on the part of the learner; he [or she] must make a choice" (p. 37).

Boeree stated (2008) that the preoperational stage lasts from age 2 to about age 7.

According to Boeree:

Now that the child has mental representations and is able to pretend, it is a short step to the use of symbols. A symbol is a thing that represents something else; for example, a drawing, a written word, or a spoken word comes to be understood as representing a real dog. The use of language is, of course, the prime example, but another good example of a symbol use is creative play, wherein checkers are cookies, papers are dishes, a box is a table, and so on. (n. p.)

Children who are poor, particularly those who have experienced long-term poverty, often come to school with many of what Maslow (1954) referred to as their basic needs unfulfilled.

According to Maslow, humanistic psychology stresses the importance of intrinsic motivation. In

his hierarchy, Maslow detailed five basic needs of all humans. The five basic needs identified by Maslow were: (a) physiological needs, (b) safety needs, (c) belonging and love needs, (d) self-esteem needs, and (g) the need for self-actualization (p. 80). Maslow later added the transcendence stage (Huitt, 2007). Moreover, Maslow also emphasized that before higher level needs are perceived, lower level needs must be satisfied. Unfortunately, for children reared in poverty, the many obstacles presented by poverty jeopardize attaining each level of need. The first four levels are:

1. physiological: hunger, thirst, bodily comforts, etc.;
2. safety or security: out of danger;
3. belongingness and love: affiliate with others, be accepted; and
4. esteem: to achieve, be competent, gain approval and recognition.

According to Maslow (1954):

It is characteristic of human beings throughout their lives to always desire something. The appearance of the drive or desire and the satisfaction that comes from attaining the goal object, gives only an artificial, single instance of gratification taken out of the total motivational unit. Motivation is constant, never ending, fluctuating, and complex, and is an almost universal characteristic of practically every state of affairs. However, a human being who is lacking food, safety, love, and esteem would probably hunger for food more strongly than anything else. (p. 80)

Maslow also indicated that if both the physiological and safety needs were fairly well gratified, there would emerge the love, affection, and belongingness needs. According to Maslow, the thwarting of these belongingness needs has been the most commonly found core of maladjustment and more severe psychopathology.

Maslow (1954) stated that people, who had been satisfied in their basic needs throughout their lives, particularly in their earlier years, seemed to develop exceptional power to withstand present or future thwarting of those needs simply because they had strong, healthy character structure because of basic satisfaction (p. 99). That is to say, people who had been made secure and strong in the earliest years, tended to remain secure and strong thereafter in the face of whatever threatened.

According to Huitt (2007), Maslow later differentiated the growth needs of self-actualization, which is the ultimate attainment in his hierarchy. These growth needs are:

1. cognitive: to know, to understand, and explore;
2. aesthetic: symmetry, order, and beauty;
3. self-actualization: to find self-fulfillment and realize one's potential; and
4. self-transcendence: to connect to something beyond the ego or to help others find self-fulfillment and realize their potential. (p. 2)

According to Davis (2007), Maslow maintained that self-transcendence was the highest need in his hierarchy of needs and suggested that it appeared in some self-actualizers as a need to find communication and connection to the cosmos. This related to his Maslow's Theory Z. Theory Z pertained to those motivated by peak experiences and other experiences of connection to the whole and self-transcendence (Davis).

Early childhood educators have advocated that curriculum and assessment should be based on the best knowledge of theory and research about how children develop and learn with attention given to an individual child's needs and interests in relation to program goals. Considering this information, well-planned preschool programs should provide training to the teachers on theories and research in early childhood, especially those theories that could adversely affect the overall continuity of the program in general.

Early Childhood Studies and Effects

According to Bracey (2003), Sharon Kagan and Linda Hallmark stated that the United States historically had resisted major government intrusions into the early years of education because such intervention would be considered to signal a failure on the part of the family. This type of resistance has produced a vicious circle: parents resist government intervention in the education of young children on ideological grounds; the government, for its part, does not produce high-quality daycare facilities; parents' resistance to government daycare solidifies because of the low quality of the care.

This view of daycare is unfortunate as evidence is now strong that high-quality daycare produces long-term positive outcomes. Three studies of specific programs have provided the evidence. Wilson (2000) described one such program:

The High/Scope Perry Preschool Project has been the focus of an ongoing longitudinal study conducted by the High/Scope Educational Research Foundation of 123 high-risk African American children. Participants were of low socioeconomic status, had low IQ scores, and were at high risk of failing school. Fifty-eight of these 3- and 4-year-old children were assigned to the program group, and 65 of these children were assigned to a control group that did not go through the program. Children attended the preschool program Monday through Friday for 2.5 hours per day over a 2-year period. During that same period, a staff to child ratio of one adult for every five or six children enabled teachers to visit each child's family in their home for 1.5 hours each week. In addition, parents participated in monthly small group meetings with other parents facilitated by program staff. (p. 2)

Wilson (2000) also indicated that only 15% of those who attended the preschool program had been placed in special education programs for mental impairment compared with 34% of the control group. Each year, from ages 7 to 14, the mean achievement test scores of the program group were noticeably higher than were those of the control group. The difference in the final achievement test scores of the two groups at age 14 was particularly significant: the program group students' scores were 29% higher than the control group's scores.

The mean school grade point average of those students who were in the High/Scope Perry Preschool project was higher than that of the control group and 71% of the program group graduated from high school compared with 54% in the control group (Wilson, 2000).

Bracey (2003) also recorded positive results for those in the High/Scope Perry Preschool Project:

A study of the High/Scope Perry Preschool Project took place regarding these preschool students at the ages of 19 and 27. At age 19, the preschoolers had higher graduation rates and were less likely to have been in special education. The preschoolers also had higher scores on the Adult Performance Level Survey, a test from the American College Testing Program that simulates real-life problem situations. By the time the two groups turned 27, 71% of the preschool group had earned high school diplomas or GEDs compared to 54% of the control group. (p. 2)

During the 1970s, the Abecedarian Randomized Experimental Trial of intensive early childhood education for low-income families began. According to Barnett and Boocock (1998):

This longitudinal study provided an opportunity to examine adolescent scholastic performance as a joint function of early intervention, personal characteristics, and family factors. The study was multidisciplinary involving a prospective, longitudinal experiment with a 2 x 2 crossover design. The original investigators included developmental and educational psychologists and pediatricians. Study participants were from families who met a predetermined level or sociodemographic risk for having a child with cognitive delays or academic problems. The High Risk Index included such factors as low levels of parental education, low income, single-parent families, and evidence of social disorganization. A very important feature of the Abecedarian program was the random assignment of participants to the treatment or control conditions. (p. 145)

Barnett and Boocock stated that infants could begin attending the childcare program as young as 6 weeks of age; the mean age at entry was 4.4 months, with a range from 6 weeks to 6 months. The program was housed in a university-owned child development center.

Before children entered public school kindergarten, the preschool treatment and control groups were randomly divided into primary-school age treatment and control groups. The school-age phase lasted for 3 years during which treated families had a home-school resource teacher who provided customized learning activities for mothers to use at home with their children (Barnett & Boocock, 1998).

According to Barnett and Boocock (1998), of the 57 subjects originally assigned to the E group, 48 remained in the study throughout the 8-year treatment period; of the 54 controls, 42 remained. The results showed that the treated preschoolers scored significantly higher on standardized tests of intellectual development during infancy and early childhood. After 3 years in school, scores on standardized tests of reading and mathematics were significantly higher for children who had preschool treatment. In contrast, there were no significant academic or intellectual benefits associated with the school-age phase alone; however, academic test scores taken at age 8 displayed a linear increase as the number of early interventions increased. Follow-up studies 4 and 7 years later, when the children were approximately 12 and 15 years old, confirmed that the earlier significant academic advantage associated with preschool persisted throughout 10 years in school.

Barnett and Boocock (1998) reported that the dependent variables in the Abecedarian project were school-age academic achievement test scores. The scores showed that children

treated in preschool consistently outperformed preschool comparison children on academic scores at every point. None of the gender differences in mean achievement scores was statistically significant.

According to Jacobson (2001), a follow-up study of the group from the Abecedarian project showed that at age 21, those who had received services were more likely to perform well on tests of intelligence, to pursue higher education, and postpone having children.

More recently, Barnett (2005) co-authored a study by the National Institute for Early Education Research at Rutgers University. This study concentrated on programs in Michigan, New Jersey, Oklahoma, South Carolina, and West Virginia. All of the model preschool program studies indicated positive initial effects. Barnett also found that prekindergarten education for disadvantaged children could greatly increase their cognitive abilities and this could lead to long-term increases in achievement and school success.

According to Education Daily (2005), researchers collected data on 5,071 preschool and kindergarten children in 1,320 classrooms during the fall of 2004. Their findings were:

1. Children who attended state-funded preschools showed vocabulary score gains about 31% greater than did children without such programs. This represented an additional 3 months' progress in vocabulary growth at age 4. This measure is strongly predictive of general cognitive abilities and later reading success.
2. State-funded preschool increased children's gains in math skills by 44%. Skills tested included basic number concepts, simple addition and subtraction, telling time, and counting money.
3. State-funded preschool produced an 85% increase in print awareness. Children who attended a state-funded preschool program before entering kindergarten knew more letters, letter-sound associations, and were more familiar with words and book concepts. (p. 2)

Barnett (2005) pointed out, "This study shows the strong evidence that quality public preschool programs produce broad gains in children's learning and development" (n. p.).

According to Weikart (1989), high-quality early childhood education programs have given poor, disadvantaged children a much needed intellectual and social head start and could benefit the nation as well serving as a means of ameliorating the effects of poverty and as a long-term

socioeconomic investment. Weikart also stated that education had assumed added importance in light of statistics showing that 22% of America's children--4.8 million of the country's 17.7 million children under age 6--currently lived in poverty. An African American child was three times more likely than a Caucasian child was to be born in poverty, and a Hispanic child was twice as likely as was a Caucasian child to be poor. The consequences of growing up poor in our society, according to Weikart, were bleak with limited futures for poor youngsters and related socioeconomic problems such as teen pregnancy, soaring school dropout rates, a growing scarcity of skilled workers, unemployment, and rising crime rates.

Longitudinal studies, some of which followed preschool graduates all the way into adulthood, have identified many positive and significant relationships between preschool participation and task-related, social, and attitudinal outcomes. According to Cotton and Conklin (2001), preschool graduates outshone nonparticipants in several ways. They had:

1. fewer referrals for remedial classes or special education;
2. fewer retentions;
3. higher grades;
4. greater social and emotional maturity;
5. more frequent high school graduation/GED completion;
6. greater academic motivation, on-task behavior, capacity for independent work, and time spent on homework;
7. lower incidence of absenteeism/detentions;
8. better attitudes toward school;
9. better self-esteem, greater internal locus control;
10. lower incidence of illegitimate pregnancy, drug use, and delinquent acts;
11. more sports participation; and
12. higher future aspirations and more postsecondary education. (p. 5)

Once out of school, young people who had attended preschool continued to make a better showing in life than those who did not attend. Adults who had attended preschool were found to have:

1. higher employment rates and better earnings and, correspondingly, a lower incidence of dependence on welfare;
2. fewer arrests and antisocial acts; and
3. better relationships with family members, a higher incidence of volunteer work, and more frequent church attendance. (p. 6)

The general theme of the foreground studies has been that good early preschool experiences could set in motion a chain of events that pervades a child's life through high school and beyond, increasing the quality of his or her life experiences along the way.

The weight of evidence from carefully drawn studies of preschool child development programs indicated that disadvantaged children who had attended good early childhood development programs were better prepared for school both intellectually and socially than children who did not attend such programs and that this early start probably helped them achieve greater success in school. Fewer poor children who attended good preschool programs have needed special education classes or been required to repeat a grade. Their greater success in school has also been the catalyst for greater success in adolescence and adulthood. Their rates of delinquency, teenage pregnancy, and welfare usage were lower and their rates of high school completion and employment were higher (Weikart, 1989, p. 2).

Early Childhood Education's Perceived Impact on Cost Effectiveness

According to a Report on Literacy Programs ("More Support for Pre-K Programs," 2006), more than 80% of business leaders said that preschool program investments were important to U.S. competitiveness and that public funding would improve America's workforce. In addition, 75% favored public funding that would enable all children to attend prekindergarten programs if their parents "chose to send them" (p. 1).

Dresang and Carr (2006) stated:

Bill Doenges saw the long-term effects of poor education on the quality of job applicants at his Ford dealership, but he also figured it was eating away the ability of his customers to earn a living. In his 40 years in the business, Doenges found a dwindling share of car buyers qualifying for traditional financing, which not only limited the vehicles they could afford but narrowed their ability on trade-ins later. He stated, "Number one, it's job related, but to me, if you look behind that, it's education." (p. 2)

According to the Pennsylvania Department of Education (2005), a cost-savings study initiated by the Pennsylvania Department of Education concluded that if prekindergarten were made available to all children, approximately 76,000, or 50%, would participate, ultimately reducing the number of students requiring special education services by 2,380 and saving Pennsylvania taxpayers \$102 million. In addition, if prekindergarten were targeted to the most at-risk students, approximately 30,640 children, or 20%, would participate; as a result, 1,590 fewer children would ultimately require special education services, saving \$68 million (Pennsylvania Department of Education).

Wisconsin's school officials conducted a similar impact study on cost effectiveness. According to a report by *Education Daily* ("Investing in Early Education Pays Off," 2005), Wisconsin schools "would save 68 cents for every dollar they invested in education for 4-year-olds" (p. 1). Using these cost estimates from the Wisconsin Department of Public Instruction and with existing savings projections, the report showed that Milwaukee would save 76 cents for every dollar invested in high-quality programs for 4-year-olds because of reductions in special education and grade retention.

Dresang and Carr (2006) reported:

Arthur Reynolds, who has been a child development authority at the University of Minnesota, has shown through his studies of the Chicago Child Parent Centers that there is potential for larger scale childhood programs to reap long-term economic benefits. Reynolds tracked more than 1,500 low income children attending the public centers over several years, and found that the average participant spent 1 ½ years in the program at a cost of \$6,692. Researchers calculated the total benefit to be nearly \$48,000 per participant; 25,800 went to the public as a result of participants paying more in taxes, which then led to less special education services and arrests for those participants. (p. 3)

According to Slass and Riordan (2006):

The 2005 State of Preschool Yearbook released by the National Institute for Early Education Research (NIEER) at Rutgers University reported that research has shown a high quality preschool program improves later high school graduation rates and college attendance, employment and earnings, as well as marriage rates. It lessens future crime and delinquency and unhealthy behaviors like smoking and drug use. In economic terms, high quality preschool returns to the individual and the public could be up to \$17 on every \$1 that is invested. (p. 1)

Weikart (1989) stated that high quality early childhood education programs gave poor, disadvantaged children a much needed intellectual and social head start and could benefit the nation as a means of ameliorating the effects of poverty and any long term socioeconomic investments.

Slass and Riordan (2005) stated that prekindergarten was without doubt a national education reform movement that had gained tremendous momentum. According to the authors, the stated budget for fiscal year 2006 was a clear indication that more state legislators were beginning to understand the academic and economic benefits of prekindergarten, as evidenced by the following statistics:

1. for fiscal year 2006, state legislators committed to increase funding for pre-kindergarten;
2. 26 states have approved increases and four others have projected to increase;
3. prekindergarten increases have reached just over \$600 million nationwide;
4. cumulative spending on state prekindergarten since fiscal year 2002 has topped \$14 billion;
5. only two states have decreased funding for prekindergarten in fiscal year 2006; and
6. more than 1 million 3- and 4-year-olds are now attending state funded prekindergarten programs. (pp.1-2)

State Funding and Benchmarks

Slass and Riordan (2006) stated that the annual report on state preschool initiatives showed that state-funded programs had increased enrollment by more than 100,000 4-year-olds from 2002 to 2005, but that state spending per child was down and enrollment actually had declined in 11 states. According to Slass and Riordan (2006), when the National Institute for Early Education Research began reporting on state-funded preschool programs for 2002, 38 states were funding preschool programs and enrolling 700,000 3- and 4-year-old children. By 2005, those states served more than 800,000 children.

According to Slass and Riordan (2006), despite difficult times for state budgets, the Yearbook showed that total state spending on preschools across the nation had grown by 7.5% over the 4 years, even after adjusting for inflation from \$2.6 billion to more than \$2.8 billion. However, when spending and enrollment data were combined to calculate state spending per pupil, it was found that inflation-adjusted state spending per child had declined by 7.3% because enrollment outpaced spending.

Slass and Riordan (2006) stated that growth in quality programs also had been slow to develop. Only Arkansas met all 10 of NIEER's quality benchmarks whereas five state programs achieved 9 of the 10. Those five states were Alabama, Illinois, North Carolina, Tennessee, and New Jersey's Abbott Program.

In the Report on Preschool Programs ("Title I Holds Promise," 2006) it was affirmed:

While most of the program's [Title I] massive \$13 billion budget goes toward k-12 education, the rules are flexible enough to allow local districts to fund preschool activities from their allotted funds. Agencies also could blend Title I with other funding streams to expand Head Start, childcare, pre-K and other early childhood services. (p. 1)

In addition to funding education services, the Report on Preschool Programs suggested Title I could also support health and social services tied to early childhood programming ("Title I holds Promise").

Policymakers, considering the costs and benefits of investing in early childhood programs that meet high standards, might wish to consider the potential savings to taxpayers that have been suggested by researchers. According to Schumacher et al. (2003):

Using a cost-benefit analysis of the Abecedarian Project, the National Institute for Early Education Research estimated that every dollar paid for the preschool program generates a four-dollar return to the children, their families, and all taxpayers. This took into account the increased earnings of the participants and their mothers, increased earnings of future generations, and savings to school districts because participants are less likely to require special education. However, the analysis did not account for potential savings caused by the reduced crime rates that have been found in later years. (p. 11)

The most effective interventions have been implemented with strong fidelity by trained staff including goal-oriented curricula informed by child development research, ensuring that children's nutritional and other health needs have been met and often including a parent-focused component to support children's development.

The impact of high quality universal preschool policies on economic growth indicated that a universal prekindergarten policy could add \$2 trillion to annual U.S. spending by 2080. By 2080, a national program could cost the federal government approximately \$59 billion but could generate enough additional growth in federal revenue to cover the costs of the program several times over (Dickens, Sawhill, & Tebbs, 2006).

Curriculum Development in Early Childhood Education

Bredenkamp et al. (1992) stated that curriculum was an organized framework that delineated the content children were to learn; it was a process through which children achieved identified curricular goals; it was what teachers did to help children achieve those goals, and it was the context in which teaching and learning occurred. Weikart (1989) added:

Among the ingredients that make for a quality early education programs is a clearly defined curriculum that allows the children to solve problems independently, to initiate meaningful conversations with peers and adults, and to explore interests on their own; a minimum of two adults supervising each group of 16 to 20 children; parental involvement in developing and operating the program; staff training in early childhood education and care; and effective evaluation procedures that help the staff observe each child's responses to the program. (p. 2)

The curriculum of any program should be an important aspect to structure the learning environment. Bredekamp et al. (1992) stated:

An important contribution to the field of child development and early childhood education was the creation of Guidelines for Developmentally Appropriate Curriculum and Assessment in Programs Serving Children 3 through 8. The National Association for the Education of Young Children (NAEYC) and the National Association Early of Childhood Specialists in the State Departments of Education (NAECS/SDE) jointly developed these guidelines to assist teachers and supervisors to: make informed decisions about appropriate curriculum, content, and assessment; evaluate existing curriculum and assessment practices; and advocate for more appropriate approaches. (p. 4)

Bredekamp et al. further stated:

These national organizations called for schooling to place greater emphasis on: (a) active, hands-on learning, (b) conceptual learning that leads to understanding along with acquisition of basic skills, (c) meaningful, relevant learning experiences, (d) interactive teaching and cooperative learning, and (e) a broad range of relevant content, integrated across traditional subject matter divisions. (p. 2)

Schumacher et al. (2003) stated that the National Research Center examined model programs with long-term effectiveness and the following were found to be present in most programs:

1. curriculum content and learning processes that cultivated school-related knowledge, with a heavy focus on language development;
2. qualified teaching staff who used reflective teaching practices aided by highly qualified supervisors;
3. Low child-teacher ratios and small class sizes;
4. Intense and coherent programming; and
5. collaborative relationships with parents. (p. 5)

In addition to these key program standards, the National Research Center (Schumacher et al., (2003) suggested that provision of comprehensive health and family nutrition and social support services were necessary to promote school readiness for poor children. A focus on comprehensive services was particularly important for disadvantaged children who had less access to health care and nutrition and whose families might have needed additional social services or help accessing them. Poor children were almost twice as likely to be reported in fair or poor health as were nonpoor children. According to Schumacher et al.:

Poor children experience increased rates of low birth weight and infant mortality, growth stunting, and lead poisoning, factors that are associated with cognitive and emotional problems. For example, low birth weight is linked with physical disabilities, reduced IQ, and grade repetition. The NRC concludes that environmental factors play a crucial role in children's early years. (p. 10)

Teachers who had less experience often relied on scripted or "teacher-proof" curricula that resulted in children receiving less-than-desirable instruction (Barnett, 2005). Barnett pointed out that scripted curricula prevented teachers from individualizing instruction, following the students' interests, and teaching children to be responsible for their own learning.

Researchers have found that less-structured programs with more child-selected activities were more beneficial than other approaches in fostering imagination, task persistence, and independence. Cotton and Conklin (2001) stated that other investigators had found, not surprisingly, that more didactic, academically oriented programs produced greater short-term cognitive gains than did other models.

According to Katterjohn (2006), the goal of early childhood development programs should be to improve a child's capacity to develop and learn. Katterjohn cited experts who agreed that children who were ready to learn in school already had the following when they arrived:

1. they were socially and emotionally healthy,
2. they had good relationships with other children,
3. they could tackle challenging tasks with persistence,
4. They had good language skills and could communicate well, and
5. They listened to instructions. (p. 2)

Thus, in implementing preschool programs effectively, all those involved must take note continuously of the entire educational system and evaluate current plans within the context of the changing whole. In order to do this effectively, educators must have adequate training that focuses on an understanding of child development and be able to implement this knowledge in all aspects of their classrooms. The best early childhood programs maintain strong program standards to ensure the conditions in which children are more likely to learn.

Teacher Training and Experience

Higher formal education levels of teachers have been linked consistently to higher quality teacher-child interactions. Childcare teachers with more formal education were more likely to receive higher scores on the rating scales used to measure overall program quality and teacher effectiveness. According to Schumacher et al. (2003):

There is evidence that specialized education and training in early childhood education and child development is linked with higher quality care, but stronger connection has been found between the number of years of education and quality of care. (p. 18)

Vail (2003) said that educating young children in developmentally appropriate ways required the best, most experienced teachers; however, those teachers tended to work elsewhere. Outside of early childhood education settings (possibly because of wages), the early childhood education profession has not been known for being a high paying or well-respected career choice.

According to Schumacher et al. (2003), an examination of data from the Cost, Quality, and Outcome Study and the Florida Improvement Study determined that teachers with at least a bachelor's degree in early childhood education were more effective. In addition, teachers with a Child Development Associate (CDA) credential or an associate of arts degree provided higher quality care than did teachers who "had some college or a high school diploma and some workshops" (p 18).

The Foundation for Child Development (2003) pointed out, even though education levels of teachers have been linked to teacher quality, the American Federation of Teachers examined teacher quality through the lens of salaries and found the average salary across the country for early childhood teachers was \$19, 610 and \$15,430 for early childhood workers. Meanwhile, the average kindergarten teacher in a public school received an annual salary of \$36, 770.

It is apparent that teachers' salaries for those in early childhood programs need to be addressed in future planning of preschool programs because highly educated, better prepared, and better-compensated teachers are more effective in the overall quality of early childhood interventions.

Sawchuck (2006) noted that the success of previous early childhood programs such as the High/Scope Perry Preschool Project, the Carolina Abecedarian Project, and Chicago's Child-Parent Centers was isolated to several key features. Some of these features included:

1. Goal-setting and accountability--each of the three programs set clear goals about what they wanted students to accomplish and backed them up with observations and assessments.
2. Focus was placed on the whole child. Programs did not merely seek to provide students with "hard" intellectual skills, but with an emphasis on creating connections between social, emotional, and physical growth.
3. Emphasis was placed on the teacher-child relationship.
4. Emphasis was placed on first-hand learning. Curricula were based on experimental learning through hands-on activities with children being taught to take responsibility for their own learning.
5. Teacher feedback--teachers in the programs were given feedback on their instruction and time to reflect on what children were learning and how to improve their practice. By doing this, they were able to plan, enact, and evaluate new activities that would build on what worked. (p. 2)

For the overall success of preschool programs to take place, it should be important to have assessment and accountability measures in place for the teachers and the students. Assessment and accountability has helped to define the programs' curriculum content and teachers' effectiveness.

Assessment and Accountability

Assessment during early childhood should be different from assessment of older children and adults for several reasons. The most important is that young children learn differently. Young children learn to construct knowledge in experimental, interactive, concrete, and hands-on ways. According to Guddemi (2003), assessment could be different during these early years because a child's development can be rapid, uneven, episodic, and highly influenced by the environment (p. 4)

Guddemi (2003) stated that early childhood assessments should be administered primarily one-on-one between a child and the child's teacher or parent. The assessment should

also be administered in short segments over a few days or even weeks because a young child's attention span is often very short. Guddemi stressed that the importance of quality instruments should meet the guidelines for reliability and validity as established by the Standards for Educational and Psychological Testing.

Most organizations and educators have agreed that assessment for young children should involve several quality assessment tools. When used together, these tools should create an assessment system that could provide information to teachers, parents, and administrators. According to Guddemi (2003), the following examples of early childhood assessment tools should be part of a quality assessment for young children:

1. Observations and checklists: A well-defined checklist used by a teacher who has had observation training for a quality assessment system. Observations of child behaviors and skills provide the teacher with a powerful measure of a child's abilities.
2. Anecdotal records: Collecting short, factual, narrative descriptions of child behaviors and skills over time is another powerful assessment tool. This type of assessment records what the child can do.
3. Running records: This type of assessment is similar to an anecdotal record but much longer. An observer objectively writes in narrative format everything the child does and says for a specific time period.
4. Portfolios: A flexible and adaptable collection over time of various concrete work samples showing many dimensions of the child's learning comprises a portfolio. This type of assessment tool is particularly suited for use in the primary grades when children are developing knowledge and skills in several subject areas at different rates.
5. Home inventories: Valuable information can be collected from surveys or a set of short, open-ended response items completed by the adult at the child's home.
6. Developmental screenings: A screening is a short set of age- and content-appropriate performance items (15-20 minute administration) that are based on a developmental continuum and linked to typical ages of development. This type of assessment is helpful in identifying major development delays.
7. Diagnostic assessments: The purpose of a diagnostic assessment is to identify a wide range of particular strengths and weaknesses and to suggest specific remediation. At one time, a diagnostic assessment was defined as an assessment to be given after a developmental screening identified a special need. A broader definition now includes a type of informal assessment used by classroom teachers to guide and inform instruction.

8. Standardized assessments: Standardized assessments provide normative and scalable data that can be aggregated and reported to administrators and policymakers. These are direct measures of children's performance, administered under stringent protocols. Standardized assessments should not be used as the sole source of information on which to make high-stakes decisions before grade three and preferably not until grade four. (p. 7)

Educators of young children should not fear a carefully chosen, quality assessment system. Such informal and formal assessments should be essential to a sound early childhood program. Quality assessments could provide teachers with valuable information about the child's developing skills and knowledge. They have led teachers to select quality early childhood activities and instruction. When quality assessments mirror quality instruction, assessment and teaching become seamless. Finally, quality assessments help teachers help the children so that no child will be left behind (Guddemi, 2003).

Although well-balanced preschool programs might contain sound curriculum, quality teachers, and assessment and accountability, it is important to remember an extension far beyond the walls of the early childhood classroom into the school building, the community, and the home.

Community and Parent Collaboration

Preschool programs must have the support of the entire community. Developmentally appropriate practices should include smooth transitions from preschool to kindergarten; therefore, teachers must work together to ensure common curriculum and assessment practices that can provide continuity throughout each child's academic career.

Researchers have suggested various ways that parents and the community could become active in local preschool programs. Bredekamp et al. (1992) provided the following list of activities that individuals or groups could do to demonstrate collaboration within preschool programs:

1. Serve on early childhood committees to identify early childhood needs and resources so that groups or agencies can support developmentally appropriate practices in early childhood.

2. Consider ways that schools and community members can work together to provide:
(a) materials to enrich early childhood environments; (b) opportunities for children and teachers to learn their of school; (c) opportunities for adults to serve as role models, tutors, aides, and experts; and (d) opportunities for children to become involved with and contribute to the community.
3. Promote school and community forums that debate the national education goals.
4. Consider ways to promote understanding and commitment from school staff, parents, and community members in order to implement developmentally appropriate practices in early childhood settings. (p. 8)

Historically, early childhood educators have acknowledged the significance of the family in the education of young children (Kemple & Nissenberg, 2000). Parents must be encouraged to take active roles in the education of their children. Measures must be taken to involve them in all aspects of their children's growth and development in school, allowing them to be partners in their children's education (Bredekamp et al., 1992). These early childhood education researchers underscored the importance of parent participation and stressed that the more intensively parents were involved, the greater were the cognitive and noncognitive benefits to their children. Virtually all successful programs have had parent education and parent involvement components and nearly all investigators cited these as being critical to a program's success (Cotton & Conklin, 2001).

According to Kemple and Nissenberg (2000):

Avenues for sharing information and ideas with parents include newsletters, handbooks, notes, bulletin boards, and photo albums documenting class activities. Other ways for exchanging information with families include meetings, conferences, phone calls, e-mails, parent visits, and participation. It is important to be guided by the understanding that family and school collaboration should be a two-way street. Many parents may have a great deal to offer to the teacher with regard to ideas for sparking creative imagination and enhancing creative thinking. One of the great advantages of including parents in collaborative educational relationships is that this contributes toward individualization of curriculum to match the needs of individual children. (p. 70)

Supporting parents in their role as educators of their children has been an important form of early childhood education and an important role of the preschool teacher (Kemple & Nissenberg).

Basis for Preschool Programs

Love and Osborne (1971) stated that preschool education for children between the ages of 2 and 6 had been given considerable attention because it seemed reasonable to claim that preschool education was not only desirable for all but under proper circumstances, also could increase the opportunity for children to learn more and to learn quicker. Prince and Howard (2002) documented the wide gap between children from lower and higher income families before they entered kindergarten. When children began school already behind, they tended to continue to fall further and further behind. High quality early childhood education could help close this gap. Prince and Howard observed, "As evidenced by previous statistics, millions of American children are living in poverty" (p.1). According to Prince and Howard, in addition to having higher drop-out rates, higher rates of retention at grade level, and higher special education placement rates, poor children were also more likely to have serious physical and mental disabilities and ill health. Therefore, poverty has been not only a powerful predictor of children's academic achievement but also an indicator highly associated with the care and well-being of children. One component of America's Goals 2000 was that every child would come to school ready to learn; unfortunately, that element has not been the case for millions of American children. Many of the nation's children have not been coming to school physically, socially, emotionally, or cognitively ready to learn. Prince and Howard found that approximately 13 million American children reared in poverty entered school with poor health and nutrition, low self-esteem, attention problems, violent experiences, and low expectations. Consequently, many of these children have come to school "with their own agenda, and their agenda has focused on survival and attainment of basic needs" (Prince & Howard, p. 28).

Children living in poor neighborhoods are faced with many conflicting messages. Because of technological advances, more and more of the jobs people hold are because of higher education; children in poverty seldom see the attractiveness of these jobs. Prince and Howard (2002) stated:

Furthermore, employment has not proven to protect families from poverty. Thirty-three percent of all poor children live in families with at least one parent working full time. Many poor children see their parents working hard each day yet continue to suffer the pains brought on by poverty. At the same time, because so many poor neighborhoods are infested with crime and drugs, these children see images of success that owe little to formal education. Since education has not worked for many adults they see, they regard classroom learning as being irrelevant to their lives. (p. 31)

Barnett (2005), director of the National Institute for Early Education Research at Rutgers University, cited research showing that a 3-year-old in a family where both parents were college graduates used as many words as did an adult in a family receiving welfare.

According to a report from *Education Daily* (“Study Finds Quality Pre-K Programs,” 2005), a study of high quality public prekindergarten programs indicated that children from all ethnic and economic backgrounds showed greater improvement in early language, literacy, and math skills than did those in the federal Head Start Program.

Wiekart (1989) affirmed that the weight of evidence from carefully drawn studies of preschool child development programs suggested that disadvantaged children who attended good early childhood development programs were better prepared for school, both intellectually and socially, than were children who did not attend such programs and that this early start probably helped them achieve greater success in school. Fewer children who have attended good preschool programs needed special education classes or had to repeat a grade. Their success in early grades was the catalyst for greater success in adolescence and adulthood.

Limitations of Preschool Intervention

Reynolds et al. (2003) cited three limitations that have reduced confidence findings for early childhood interventions:

1. Most of the evidence for the link between preschool participation and long-term effects on well being came from model programs rather than established, large-scale programs run by human service agencies and schools. Evidence from the large-scale programs established that they have been necessary to assess the effectiveness of state and federal programs.
2. Few studies have demonstrated the cost-effectiveness of early intervention and no studies of large-scale public programs have investigated cost-effectiveness.

Identifying programs that provide the greatest returns to society should be a high priority.

3. Components that produce long-term effects are not well understood. Researchers have not conducted studies that have comprehensively examined these and other representations until recently; yet such studies would enhance understanding of how to strengthen the maintenance of the long term gains. (p. 634)

Schumacher et al. (2003) stated:

Over the last few years, many states have begun to reimburse providers of subsidized child-care with higher payment levels if they already meet higher standards, but the vast majority of child care continues to be operated without program standards required upfront and without the financing that can help assure they can meet high-quality standards. (p. 12)

Although all states have licensing requirements for formal child-care providers, these regulations have provided only a floor under which the health and safety of children in such care may not fall. Such basic protections usually have not met recommended standards to enhance the quality of early learning experiences of children. According to Schumacher et al. (2003):

The National Association for the Education of Young Children (NAEYC) child-care center accreditation criteria requires a ratio of 1 teacher to no more than 10 preschool age children. In 2002, only 19 states required the maximum ratio for 4-year-olds, and 31 states required it for 3-year-olds. State licensing requirements have also been minimal with regard to teacher education and experience; 30 states allowed teachers in child-care centers to work with children before receiving any preservice training in early childhood development. States rarely provided licensors with much preservice training, nor did they provide sufficient funding to keep licensing caseloads below recommended levels. (p. 7)

Some features of the childcare system in the United States have presented further challenges. Most childcare facilities have been operated by private providers and are paid for by parents on their own or with assistance from public subsidies. Most states have relied heavily on vouchers to distribute childcare subsidies; this has often meant that childcare providers cared for a mix of children who were both subsidized and unsubsidized. Schumacher et al. (2003) said, given the fact that a program could have few subsidized children in a class, it might be difficult for a voucher system to provide a sufficient number of additional resources to facilitate higher standards in programs that needed a lot of assistance. Because of these factors, Schumacher et al. added:

Studies of child-care supply have found that the majority of centers rate poor to mediocre on widely used measures of early learning environments and program standards. While no nationally representative study has ever been conducted, a study in the early 1900s of 1,364 children at 10 research sites found that most child-care settings were only fair in quality and children in low income families received poor quality care. In another comprehensive study of child-care centers in four states conducted in the mid 1990s, researchers used the Early Childhood Environmental Rating Scale (ECERS) and the Infant Toddler Rating Scale (ITERS) to measure child-care quality and found that only one in seven centers had an early childhood environment of sufficient quality to promote the cognitive development and socioemotional functioning of children while one out of eight centers was of such poor quality as to threaten the health and safety of children. (p. 8)

Most educators and researchers across relevant disciplines have agreed that early childhood serves as a critical time to begin preventing achievement gaps. Comprehensive service programs intended to close those gaps have typically offered interventions and other health and social services (Welch-Ross et al., 2002).

Universal Prekindergarten

The United States has historically undervalued its youngest citizens. Programs for those younger than 5 years have been generally weaker, facilities have been less adequate, and financial support from government sources has been less sufficient. Whereas much has been said in recent years about leaving no child behind, not enough has been done to keep more youngsters in the race for life's blessings. According to Maeroff (2003), the outcomes of efforts to implement universal prekindergarten--one of the most important elements in this pursuit--have represented a barometer of children's status.

Maeroff (2003) contended that proponents of universal prekindergarten found it necessary to justify the essentiality of their goal. Expert testimony and studies such as one by the National Research Council that praised the merits of high-quality programs in preparing youngsters to adapt to the demands of formal school programs have nudged the nation in this direction. Economic analysis has shown that early learning has been more efficient and productive for society as a whole by less expenditure farther down the line and an improvement in the skills of workers. Coyle (2000) found that early childhood education programs yielded

\$7.16 for every dollar invested through a reduction in special education, remedial education, welfare benefits, and crime and an increase in earnings. *Education Daily* (“Investing in Early Education Pays Off,” 2005) conducted an economic impact study that showed schools in Wisconsin would save 68 cents for every educational dollar if invested in education for 4-year-olds.

A problem with prekindergarten has been uneven access. Families at the far ends of the economic spectrum have been more likely to enroll children in early education. The poorest have had federally funded Head Start, although it has reached barely half the eligible children. Affluent families have had money to send their children to private nursery schools. A challenge for universal prekindergarten will be to find places for the vast number of Americans in the economic middle, especially the near poor who do not qualify for Head Start and cannot afford unsubsidized nursery schools (Maeroff, 2003). Maeroff also stated that one rationale for universal prekindergarten involved the wish to throw a wider net than that of Head Start, which began as a weapon in the War on Poverty and never grew into the entitlement program it was supposed to become.

It might be beneficial to regard prekindergarten as part of an educational experience that begins at age 3 and carries through to age 8, a so-called P-3 continuum. This approach, in effect, bundles prekindergarten and full-day kindergarten into a progression that culminates with the conclusion of third grade.

According to the Institute of Governmental Studies (2007), opponents of universal prekindergarten have claimed that students who attended early preschool did not necessarily do better than students who waited until kindergarten. Critics have said that universal preschool did not make sense in terms of capacity, and that giving access to all 3- to 5-year-olds would actually create a preschool shortage. They also have said that a more rational approach would be to target low-income children specifically.

In addition, a Universal Preschool Education Policy Brief (2004) noted that opponents of universal prekindergarten programs conceded that pouring resources to the most desperate

children could produce some benefits. Yet, they also claimed that 4-1 or 7-1 rates of return invested in a program for all children were not honest. There have been no academic studies other than a program serving the most desperately at-risk children that linked costs to benefits for a universal preschool program

To build a firm foundation to ensure that it could bear the weight of learning that might be heaped upon it could take time. Early gains should not be allowed to dissipate in the way research indicated has happened to children after Head Start (Maeroff, 2003).

Maeroff (2003) further stated:

Six states do not even require school districts to offer kindergarten, and, even when states mandate that districts have kindergarten, pupils must attend in only 15 states. The compulsory age for starting school remains at 7 years old in 18 states. (p. 12)

A self-contained P-3 continuum could also offer a nongraded, interage program letting pupils progress at their own pace with less concern about grade-to-grade promotion and more emphasis on reaching a certain threshold of learning by the end of third grade. The implementation of universal prekindergarten could help disabled students and English-language-learners get closer attention in a more personalized P-3 set-up.

Summary

According to Schumacher et al. (2003), perhaps the greatest barriers to integrating high program standards in childcare have been financial. Matthews and Ewen (2005) found that (a) total child-care spending fell for the 2nd consecutive year; (b) 22 states made cuts in total childcare spending, 16 of them for the 2nd consecutive year; (c) the decline in total childcare spending was the result of a decline in federal Temporary Assistance for Needy Families funds spent on childcare; and (d) the number of children who received childcare assistance continued to decline (p. 2). Matthews and Ewen also pointed out the high costs of childcare was difficult for most parents to meet. Their recent study indicated that fees for childcare spending for young children were equal to or greater than the average amount that families spent on food. These

costs were particularly burdensome for poor and low-income families who paid a significantly higher share of their income for care than did upper-income families (Matthews & Ewen).

Matthews and Ewen (2005) stated that the Bush Administration estimated that 2.2 million children received childcare assistance from all sources in 2005 as compared to 2.3 million children in 2004. The Administration estimated that if funding were to remain at the current level, 1.8 million children would be receiving assistance by 2011. As pointed out by Matthews and Ewen, "This represents a decline of 25%, or 650,000, children, from fiscal year 2000" (p. 5).

The national economy and state budget woes have meant that investigators need to improve program standards or the early learning environments for children could suffer as many states struggle to maintain basic services. According to Reynolds, Temple, Robertson, and Mann (2001), researchers from the Chicago Child-Parent Center Program have indicated that it will be more costly in the long run if measures are not taken at the opportune time children spend in childcare to prepare them for greater challenges in school. Participation in an established early childhood intervention program for low-income children was associated with better educational and social outcomes up to age 20 years. These findings were among the strongest evidence that established programs administered through public schools could promote children to long-term success.

Dickens et al. (2006) maintained that a more educated labor force would be more mobile and adaptable, could learn new tasks and skills more easily, could use a wider range of technologies and sophisticated equipment, and could be more creative in thinking about how to improve the management of work. All of these attributes not only make a more highly skilled worker more productive than a less skilled one but could also enable employers to organize their work places differently and adjust better to changes necessitated by competition, by technical advances, or by changes in consumer demand.

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this study was to determine if a difference in achievement test scores exist between students who attended preschool and those who did not as measured by standardized achievement test scores of students in the third and fourth grades. This chapter is organized into the following sections: (a) research design, (b) population, (c) student achievement, (d) data collection, (e) data analysis, and (f) summary.

Research Design

This was an archival quasi-experimental study, employing analysis of variance (ANOVA) to analyze the data in an effort to determine associations between attendance in a preschool program (measured as attended a preschool program versus did not attend), gender, and the students' third- and fourth-grade achievement test scores in language arts, math, science, and social studies. ANOVA is a statistical procedure that compares the amount of between-groups variance in an individual's scores with the amount of within-groups variance (Gall et al. 2007, p. 318). Stevens (1996) offered two benefits of factorial ANOVA. The first factorial analysis enabled researchers to examine the joint effect of independent variables. The two factors used in this study were gender and attendance in a preschool program (whether or not students attended a preschool program). A second advantage of factorial designs was that they could increase power by reducing error or within-cell variance. The intent was to determine the effectiveness of the preschool programs and to provide information regarding maximum effectiveness for use in future decision-making. Further analysis of chi-square tests were performed to investigate the null hypotheses for data, expressed as frequencies.

Population

The Greeneville City School system serves the students of Greeneville, Tennessee, a small town located at the foothills of the Unaka Mountains in Northeastern Tennessee. During the period of data gathered for this study (2006-2007), an average of 2,697 students attended the four elementary schools, one middle school, and one high school. Of this number, 398 were fourth or fifth graders in 2006-2007. Students who took the Tennessee Comprehensive Assessment Program (TCAP) during the 2006-2007 school year were included in the final analysis, resulting in a population of 398 students. A questionnaire sent to parents of fourth- and fifth-grade students during the 2007-2008 school year yielded a population of 369 students; within this population, 188 were fourth graders and 189 were fifth graders. Students were eliminated from the study if their parents did not complete and return the questionnaire (see Appendix A) or if they did not take the TCAP during the time the study was conducted.

Student Achievement

Student achievement was measured using the Tennessee Comprehensive Assessment Program (TCAP) test. This is a test of achievement adopted by the state of Tennessee for purposes of measuring student achievement, scale scores, and proficiency. Students in grades three through eight take the TCAP each spring. The achievement test is a timed, multiple choice assessment that measures skills in reading, language arts, mathematics, science, and social studies. The TCAP assessment test is copyrighted by CTB McGraw Hill (Teacher's Guide to *TerraNova*, 1997).

The reading-language arts portion of the TCAP test consists of two subtests: reading and language arts. This test, in grades three and four, examines basic concepts of content, meaning, vocabulary, writing-organization, writing-process, grammar-conventions, and techniques-skills.

The mathematics portion in grades three and four examines number sense-theory, computation, algebraic thinking, real-world problems, data analysis, probability, measurement, and geometry. Social studies in the third grade consists of economics, government-civics,

human geography, physical geography, and history. The fourth grade TCAP social studies portion tests economics, government-civics, human geography, U.S. history period 1 (Beginnings -1820), and U.S. history period 2 (1801-1861). Finally, the third grade and fourth grade science portion includes structure and function of organisms, ecology, life cycles and biological change, earth's features and resources, motion and forces of energy, and matter; the fourth-grade test includes one portion on space, weather, and climate. All of the TCAP tests given determine if a child is nonproficient, proficient, or advanced proficient in the academic areas tested. Scores were taken from reports supplied by the state of Tennessee.

Data Collection

Data were collected on students who were in grades three and four during the 2006-2007 school year. These students' scores were retrieved for the 2007-2008 school year. A questionnaire (see Appendix A) was sent to parents regarding their child's attendance in a program for 4-year olds. This was sent on September 6th and 7th of 2007. Students were eliminated from the study if their parents did not complete and return the questionnaire (See Appendix A) or if they did not take the TCAP during the time the study was conducted.

Demographic data including grade level, school, gender, and race were collected for each student. Those students who attended a preschool program within the Greeneville City School system and those who never attended a preschool program were retrieved from archival data and the questionnaires completed by parents. A unique I.D. number was assigned to each student for the purposes of this study. The students' scale scores from the 2006-2007 school year were used to categorize students who were nonproficient, proficient, and advanced proficient according to the TCAP testing scores. The criteria used by the Tennessee State Department were used to determine these classifications.

Data were entered into a PC using Microsoft Office 2007 © as the word processing program. These data were then transferred into SPSS © statistical package. A data file was created and various statistical procedures were applied.

An analysis of variance (ANOVA) test of dependent variables was conducted to determine significance among groups. An additional chi-square test was used to investigate the null hypotheses for data, expressed as frequencies. The director of schools for Greeneville City granted approval for this study on January 24, 2005 (See Appendix C). After initial approval was obtained from the director of schools, the ETSU Institutional Review Board granted permission to pursue completion of the study on August 10, 2007 (See Appendix D).

Research Questions and Hypotheses

The following questions served as a focal point of the study:

1. Are there differences in third-grade achievement test scores for language arts, math, science, and social studies based on (a) gender, (b) attendance in a preschool program, and (c) interaction between gender and attendance in a preschool program?

To answer this research question, four two-factor ANOVA models were conducted, one for each of the criterion variables. Each ANOVA model tested three null hypotheses:

- Ho1₁: There is no difference in the third-grade language arts achievement test scores between boys and girls.
- Ho1₂: There is no difference in the third-grade language arts achievement test scores between those who attended a preschool program and those who did not.
- Ho1₃: For third-grade language arts, there is no significant two-way interaction between gender and attendance in a preschool program.
- Ho1₄: There is no difference in the third-grade math achievement test scores between boys and girls.
- Ho1₅: There is no difference in the third-grade math achievement test scores between those who attended a preschool program and those who did not.
- Ho1₆: For third-grade math, there is no significant two-way interaction between gender and attendance in a preschool program.

Ho1₇: There is no difference in the third-grade science achievement test scores between boys and girls.

Ho1₈: There is no difference in the third-grade science test achievement scores between those who attended a preschool program and those who did not.

Ho1₉: For third-grade science, there is no significant two-way interaction between gender and attendance in a preschool program.

Ho1₁₀: There is no difference in the third-grade social studies achievement test scores between boys and girls.

Ho1₁₁: There is no difference in the third-grade social studies achievement test scores between those who attended a preschool program and those who did not.

Ho1₁₂: For third-grade social studies, there is no significant two-way interaction between gender and attendance in a preschool program.

2. Are there differences in fourth-grade achievement test scores for language arts, math, science, and social studies based on (a) gender, (b) attendance in a preschool program, and (c) interaction between gender and attendance in a preschool program?

To answer this research question, four two-factor ANOVA models were conducted, one for each of the criterion variables. Each model tested three null hypotheses:

Ho2₁: There is no difference in the fourth-grade language arts achievement test scores between boys and girls.

Ho2₂: There is no difference in the fourth-grade language arts achievement test scores between those who attended a preschool program and those who did not.

Ho2₃: For fourth-grade language arts, there is no significant two-way interaction between gender and attendance in a preschool program.

Ho2₄: There is no difference in the fourth-grade math achievement test scores between boys and girls.

- Ho2₅: There is no difference in the fourth-grade math achievement test scores between those who attended a preschool program and those who did not.
- Ho2₆: For fourth-grade math, there is no significant two-way interaction between gender and attendance in a preschool program.
- Ho2₇: There is no difference in the fourth-grade science achievement test scores between boys and girls.
- Ho2₈: There is no difference in the fourth-grade science achievement test scores between those who attended a preschool program and those who did not.
- Ho2₉: For fourth-grade science, there is no significant two-way interaction between gender and attendance in a preschool program.
- Ho2₁₀: There is no difference in the fourth-grade social studies achievement test scores between boys and girls.
- Ho2₁₁: There is no difference in the fourth-grade social studies achievement test scores between those who attended a preschool program and those who did not.
- Ho2₁₂: For fourth-grade social studies, there is no significant two-way interaction between gender and attendance in a preschool program.

Summary

This chapter focused on the process to determine the effectiveness of a preschool program on the achievement scores of the population. Each hypothesis was tested to determine the between group variance in an individual's scores with the amount of within-groups variance. To answer each research question, four two-factor ANOVA models were conducted, one for each of the criterion variables. The results of these two-factor ANOVA's are presented in Chapter 4 along with a summary of the results and a description of the population.

CHAPTER 4

ANALYSIS OF DATA

The purpose of this study was to determine if a difference in achievement test scores exist between students who attended preschool and those who did not as measured by standardized achievement test scores of students in the third and fourth grades. Data were collected from surveys obtained from parents and from archival data located within the Greeneville City School system's central office.

Of the 369 students who were fourth and fifth graders during the 2007-2008 school year, those who did not take the Tennessee Comprehensive Assessment Program (TCAP) and those whose parents did not complete the survey were excluded from the study. The resulting population numbered 185 students and represented a response rate of 51.1%.

The two-way ANOVA models used in this study examined the relationship of preschool attendance on the achievement test scores of third and fourth graders in language arts, math, science, and social studies. Each model also took into account the gender of the student. A further analysis of a chi-square test was performed to investigate the null hypotheses for data, expressed as frequencies.

This chapter is organized into three sections, each of which is associated with one or more of the guiding research questions presented in Chapter 1. Third-grade test scores in relation to preschool attendance and gender are presented first. The second section contains the fourth-grade scores in relation to preschool attendance and gender. The final section is a summary of the findings.

Description of the Population

The population in this study consisted of those students who attended Greeneville City Schools during the 2007-2008 school year. Of this population, 41 were fourth-grade male

students and 48 were fifth-grade male students, resulting in a total of 89 males or 48.1% of the total population. In addition, 55 of the fourth-grade population were females and 41 fifth-grade students were females, with a total of 96 or 51.9% of the total population.

The breakdown as to fourth- and fifth-grade students is shown in Table 1.

Table 1

Population Demographics of Fourth- and Fifth-Grade Students

	Male		Female		Total	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Fourth-Grade Students	41	42.7	48	53.9	89	48.1
Fifth-Grade Students	<u>55</u>	<u>57.3</u>	<u>41</u>	<u>46.1</u>	<u>96</u>	<u>51.9</u>
Total	96	100.0	89	100.0	185	100.0

Of this population, 49 students did not attend preschool, 50 attended preschool within the Greeneville City School system, and 86 attended preschool elsewhere. This resulted in a population of 26.5% who did not attend a preschool program and 73.5% who had attended preschool. Table 2 shows a summary of those students who attended preschool and those did not attend preschool by grade level.

Table 2

Preschool Attendance by Grade Level

		Fourth-Grade		Fifth-Grade		Total	
		<i>N</i>	%	<i>N</i>	%	<i>n</i>	%
Attended preschool	No	22	22.9	27	30.3	49	26.5
	Yes	<u>74</u>	<u>77.1</u>	<u>62</u>	<u>69.7</u>	<u>136</u>	<u>73.5</u>
	Total	96	100.0	89	100.0	185	100.0

*Student Achievement**Research Question #1*

Are there differences in third-grade achievement test scores for language arts, math, science, and social studies based on (a) gender, (b) attendance in a preschool program, and (c) interaction between gender and attendance in a preschool program? To answer this research question, four two-factor ANOVA models were conducted, one for each of the criterion variables.

The following hypotheses were tested concerning third-grade language arts:

Ho₁: There is no difference in the third-grade language arts achievement test scores between boys and girls.

Ho₂: There is no difference in the third-grade language arts achievement test scores between those who attended a preschool program and those who did not.

Ho₃: For third-grade language arts, there is no significant two-way interaction between gender and attendance in a preschool program.

For third-grade language arts achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant, $F(1, 92) = 1.36$, $p = .25$. The null hypothesis for the interaction term was retained. There was no significant difference in the language arts achievement test scores between third-grade students who attended a preschool

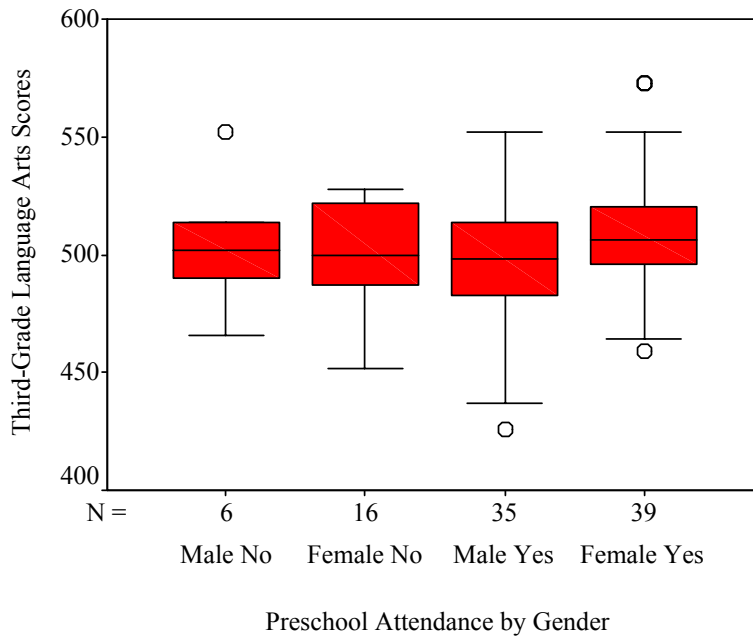
program and those who did not, $F(1, 92) = .03, p = .86$. The effect size for attendance in a preschool was small ($<.01$). The language arts achievement test scores mean for third-graders who did not attend a preschool program ($M = 500.27, SD = 24.75$) was almost identical to the mean of third-grade students who attended a preschool program ($M = 503.07, SD = 27.48$). There was also no significant difference in the language arts achievement test scores between male and female third-grade students, $F(1, 92) = .14, p = .71$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($<.01$). The language arts mean for boys ($M = 498.32, SD = 28.71$) was only a slightly lower than the mean for girls ($M = 505.49, SD = 25.08$). Table 3 shows the means and standard deviations for third-grade language arts achievement scores by attendance in a preschool program and gender.

Table 3

Means and Standard Deviations for Third-Grade Language Arts Scores by Preschool Attendance and Gender

Attended Preschool	Gender	<i>N</i>	<i>M</i>	<i>SD</i>
No	Male	6	504.33	28.58
	Female	16	498.75	24.01
	Did Not Attend Total	22	500.27	24.75
Yes	Male	35	497.29	29.02
	Female	39	508.26	25.28
	Attended Total	74	503.07	27.48
Gender	Male	41	498.32	28.71
	Female	55	505.49	25.08
	Population Total	96	502.43	26.78

Figure 1 shows the boxplot for the language arts scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range

Figure 1. Boxplot for Third-Grade Language Arts Scores by Attendance in a Preschool Program and Gender

The following hypotheses were tested concerning third-grade math:

Ho₁₄: There is no difference in the third-grade math achievement test scores between boys and girls.

Ho₁₅: There is no difference in the third-grade math achievement test scores between those who attended a preschool program and those who did not.

Ho₁₆: For third-grade math, there is no significant two-way interaction between gender and attendance in a preschool program.

For third-grade math achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant, $F(1, 92) = .002, p = .97$. The null hypothesis for the interaction was retained. There was no significant difference in the math achievement test scores between third-grade students who attended a preschool program and

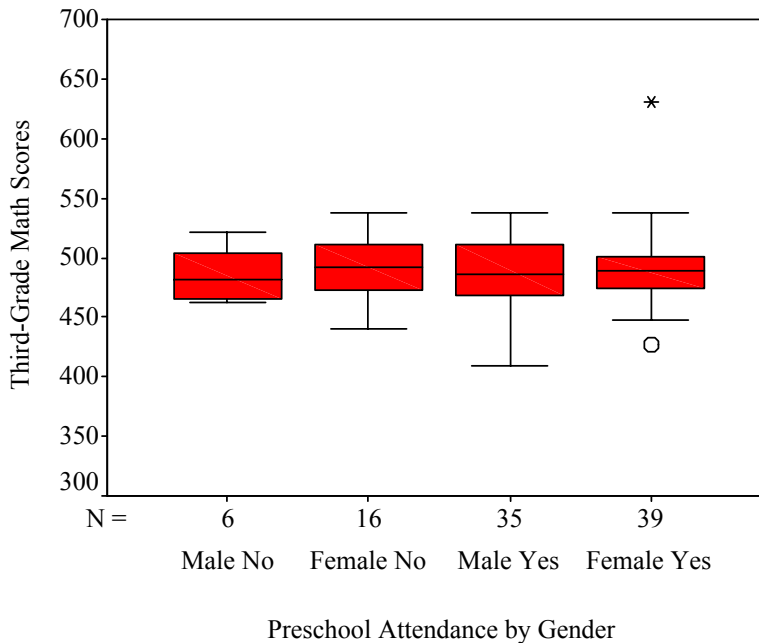
those who did not, $F(1, 92) = .01, p = .92$. The effect size for the attendance in a preschool was small ($<.01$). The math achievement test scores mean for third-graders who did not attend a preschool program ($M = 489.18, SD = 24.95$) was almost identical to the mean of third-grade students who attended a preschool program ($M = 489.09, SD = 31.03$). There was also no significant difference in the math achievement test scores between male and female third-grade students, $F(1, 92) = .35, p = .56$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($<.01$). The math mean for boys ($M = 486.37, SD = 30.20$) was only a slightly lower than was the mean for girls ($M = 491.16, SD = 29.29$). Table 4 shows the means and standard deviations for third-grade math achievement test scores by attendance in a preschool program and gender.

Table 4

Means and Standard Deviations for Third-Grade Math Achievement Test Scores by Preschool Attendance and Gender

Attended Preschool	Gender	<i>N</i>	<i>M</i>	<i>SD</i>
No	Male	6	486.00	24.38
	Female	16	490.38	25.84
	Did Not Attend Total	22	489.18	24.95
Yes	Male	35	486.43	31.39
	Female	39	491.49	30.91
	Attended Total	74	489.09	31.03
Gender	Male	41	486.37	30.20
	Female	55	491.16	29.29
	Population Total	96	489.11	29.62

Figure 2 shows the boxplot for the math achievement test scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range
 * = an observation more than 3.0 times the interquartile range

Figure 2. Boxplot for Third-Grade Math Scores by Attendance in a Preschool Program and Gender

The following hypotheses were tested concerning third-grade science:

Ho1₇: There is no difference in the third-grade science achievement test scores between boys and girls.

Ho1₈: There is no difference in the third-grade science test achievement scores between those who attended a preschool program and those who did not.

Ho1₉: For third-grade science, there is no significant two-way interaction between gender and attendance in a preschool program.

For third-grade science achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant, $F(1, 92) = .56, p = .46$. The null hypothesis for the interaction term was retained. There was no significant difference in the science achievement test scores between third-grade students who attended a preschool program

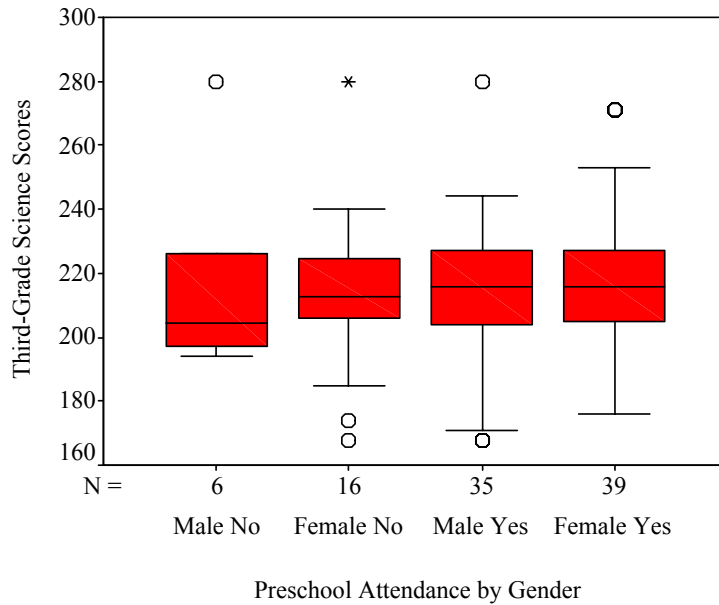
and those who did not, $F(1, 92) = .03, p = .88$. The effect size for attendance was small ($< .01$). The science achievement test scores mean for third graders who did not attend a preschool program ($M = 214.73, SD = 27.45$) was almost identical to the mean of third-grade students who attended a preschool program ($M = 216.80, SD = 22.82$). There was also no significant difference in the science achievement test scores between male and female third-grade students, $F(1, 92) = .01, p = .91$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($< .01$). The science mean for boys ($M = 214.44, SD = 24.04$) was lower than the mean for girls ($M = 217.73, SD = 23.79$). Table 5 shows the means and standard deviations for third-grade science achievement test scores by attendance in a preschool program and gender.

Table 5

Means and Standard Deviations for Third-Grade Science Scores by Preschool Attendance and Gender

Attended Preschool	Gender	<i>N</i>	<i>M</i>	<i>SD</i>
No	Male	6	217.67	32.87
	Female	16	213.63	26.27
	Did Not Attend Total	22	214.73	27.45
Yes	Male	35	213.89	22.78
	Female	39	219.41	22.84
	Attended Total	74	216.80	22.82
Gender	Male	41	214.44	24.04
	Female	55	217.73	23.79
	Population Total	96	216.32	23.82

Figure 3 shows the boxplot for the science achievement test scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range
 * = an observation more than 3.0 times the interquartile range

Figure 3. Boxplot for Third-Grade Science Scores by Attendance in a Preschool Program and Gender

The following hypotheses were tested concerning third-grade social studies:

Ho1₁₀: There is no difference in the third-grade social studies achievement test scores between boys and girls.

Ho1₁₁: There is no difference in the third-grade social studies achievement test scores between those who attended a preschool program and those who did not.

Ho1₁₂: For third-grade social studies, there is no significant two-way interaction between gender and attendance in a preschool program.

For third-grade social studies achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant, $F(1, 92) = .07, p = .80$. The null hypothesis for the interaction term was retained. There was no significant difference in the social studies achievement test scores between third-grade students who attended a preschool

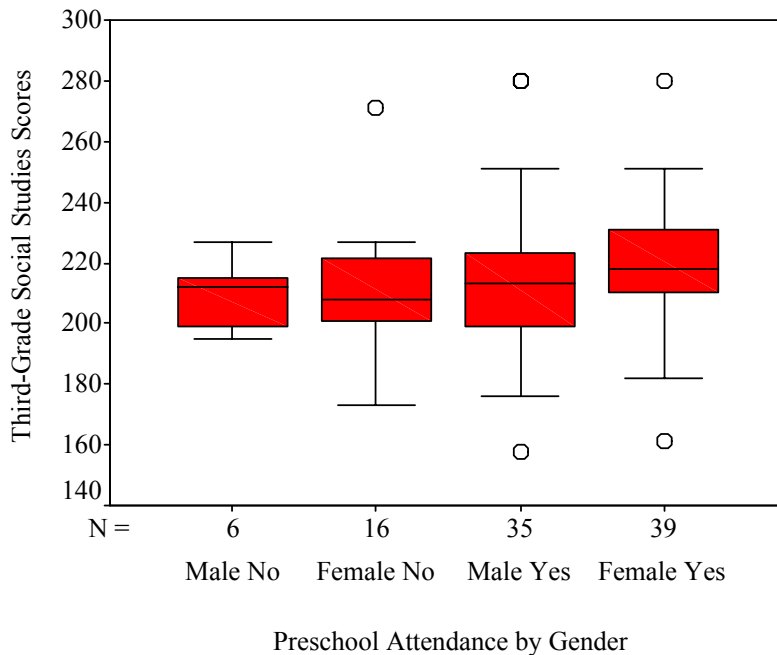
program and those who did not, $F(1, 92) = .72, p = .40$. The effect size for attendance in a preschool was small (.01). The social studies achievement test scores mean for third graders who did not attend a preschool program ($M = 211.09, SD = 18.96$) was only slightly lower than the mean of third-grade students who attended a preschool program ($M = 215.99, SD = 23.44$). likewise, there was no significant difference in the social studies achievement test scores between male and female third-grade students, $F(1, 92) = .26, p = .61$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($< .01$). The social studies mean for boys ($M = 213.02, SD = 24.08$) was lower than the mean for girls ($M = 216.24, SD = 21.35$). Table 6 shows the means and standard deviations for third-grade social studies achievement test scores by attendance in a preschool program and gender.

Table 6

Means and Standard Deviations for Third-Grade Social Studies Scores by Preschool Attendance and Gender

Attended Preschool	Gender	<i>N</i>	<i>M</i>	<i>SD</i>
No	Male	6	210.00	11.58
	Female	16	211.50	21.40
	Did Not Attend Total	22	211.09	18.96
Yes	Male	35	213.54	25.70
	Female	39	218.18	21.30
	Attended Total	74	215.99	23.44
Gender	Male	41	213.02	24.08
	Female	55	216.24	21.35
	Population Total	96	214.86	22.49

Figure 4 shows the boxplot for the social studies scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range
 * = an observation more than 3.0 times the interquartile range

Figure 4. Boxplot for Third-Grade Social Studies Scores by Attendance in a Preschool Program and Gender

Research Question #2

Are there differences in fourth-grade achievement test scores for language arts, math, science, and social studies based on (a) gender, (b) attendance in a preschool program, and (c) interaction between gender and attendance in a preschool program?

The following hypotheses were tested concerning fourth-grade language arts:

Ho2₁: There is no difference in the fourth-grade language arts achievement test scores between boys and girls.

Ho2₂: There is no difference in the fourth-grade language arts achievement test scores between those who attended a preschool program and those who did not.

Ho2₃: For fourth-grade language arts, there is no significant two-way interaction between gender and attendance in a preschool program.

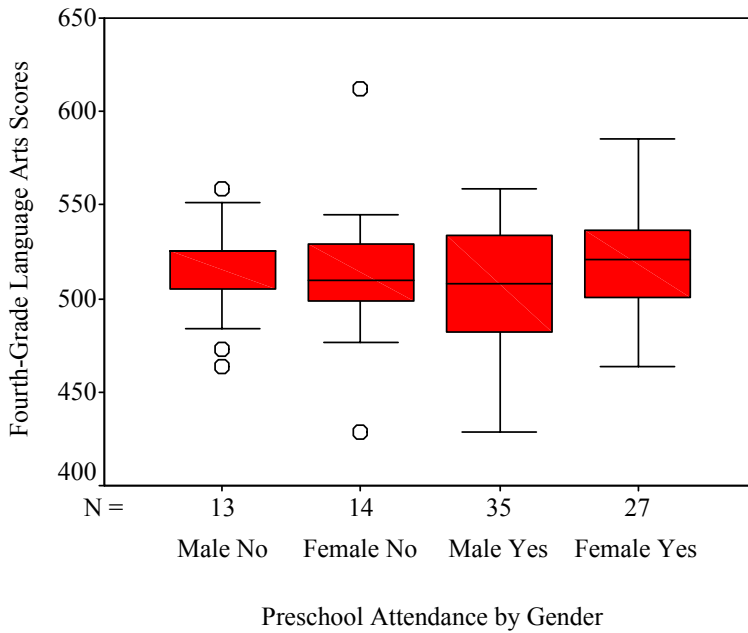
For fourth-grade language arts achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant, $F = (1, 85) = 1.17, p = .28$. The null hypothesis for the interaction term was retained. There was no significant difference in the language arts achievement test scores between fourth-grade students who attended a preschool program and those who did not, $F = (1, 85) = .08, p = .78$. The effect size for attendance in a preschool was small ($< .01$). The language arts achievement test scores mean for fourth-graders who did not attend a preschool program ($M = 515.00, SD = 34.89$) was almost identical to the mean of fourth-grade students who attended a preschool program ($M = 512.19, SD = 31.75$). Likewise, there was no significant difference in the language arts achievement test scores between male and female fourth-grade students, $F(1, 85) = .32, p = .57$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($< .01$). The language arts mean for boys ($M = 509.54, SD = 31.67$) was only slightly lower than the mean for girls ($M = 517.15, SD = 33.49$). Table 7 shows the means and standard deviations for fourth grade language arts achievement test scores by attendance in a preschool program and gender.

Table 7

Means and Standard Deviations for Fourth-Grade Language Arts Scores by Preschool Attendance and Gender

Attended Preschool	Gender	<i>N</i>	<i>M</i>	<i>SD</i>
No	Male	13	517.00	29.31
	Female	14	513.14	40.43
	Did Not Attend Total	27	515.00	34.89
Yes	Male	35	506.77	32.47
	Female	27	519.22	29.92
	Attended Total	62	512.19	31.75
Gender	Male	48	509.54	31.67
	Female	41	517.15	33.49
	Population Total	89	513.04	32.56

Figure 5 shows the boxplot for the Language Arts scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range

*** = an observation more than 3.0 times the interquartile range

Figure 5. Boxplot for Fourth-Grade Language Arts Scores by Attendance in a Preschool Program and Gender

The following hypotheses were tested concerning fourth-grade math:

Ho₂₄: There is no difference in the fourth-grade math achievement test scores between boys and girls.

Ho₂₅: There is no difference in the fourth-grade math achievement test scores between those who attended a preschool program and those who did not.

Ho₂₆: For fourth-grade math, there is no significant two-way interaction between gender and attendance in a preschool program.

For fourth-grade math achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant, $F(1, 85) = .31, p = .58$. The null hypothesis for the interaction term was retained. There was no significant difference in the math

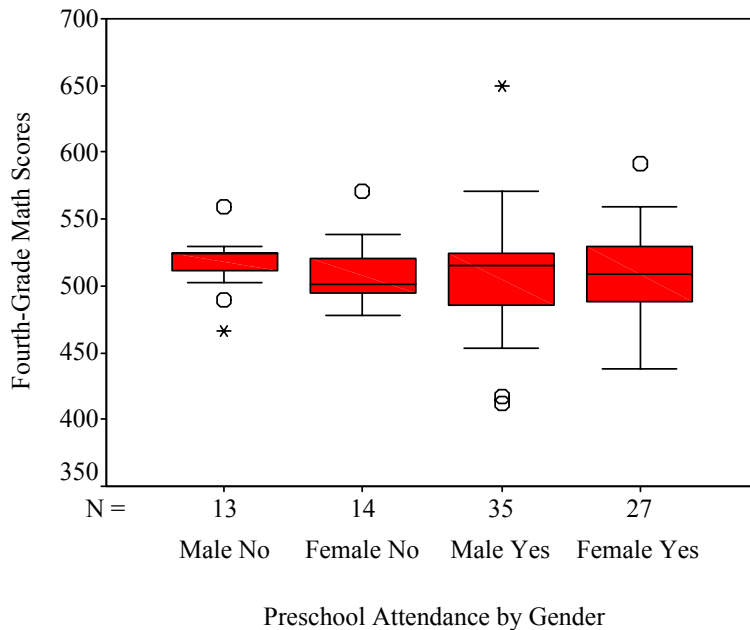
achievement test scores between fourth-grade students who attended a preschool program and those who did not, $F(1, 85) = .49, p = .49$. The effect size for attendance in a preschool was small (.01). The math achievement test scores mean for fourth graders who did not attend a preschool program ($M = 513.33, SD 23.65$) was almost identical to the mean for fourth-grade students who attended a preschool program ($M = 507.68, SD 38.99$). Also, there was no significant difference in the math achievement test scores between male and female fourth-grade students, $F(1, 85) = 17, p = .68$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($< .01$). The math mean for boys ($M = 509.96, SD = 38.67$) was slightly lower than the mean for girls ($M = 508.73, SD = 30.65$). Table 8 shows the means and standard deviations for fourth-grade math achievement test scores by attendance in a preschool program and gender.

Table 8

Means and Standard Deviation for Fourth-Grade Math Scores by Preschool Attendance and Gender

Attended Preschool	Gender	<i>N</i>	<i>M</i>	<i>SD</i>
No	Male	13	517.46	22.12
	Female	14	509.50	25.18
	Did Not Attend Total	27	513.33	23.65
Yes	Male	35	507.17	43.19
	Female	27	508.33	33.58
	Attended Total	62	507.68	38.99
Gender	Male	48	509.96	38.67
	Female	41	508.73	30.65
	Population Total	89	509.39	35.01

Figure 6 shows the boxplot for the math scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range
 * = an observation more than 3.0 times the interquartile range

Figure 6. Boxplot for Fourth-Grade Math Scores by Attendance in a Preschool Program and Gender

The following hypotheses were tested concerning fourth-grade science:

Ho2₇: There is no difference in the fourth-grade science achievement test scores between boys and girls.

Ho2₈: There is no difference in the fourth-grade science achievement test scores between those who attended a preschool program and those who did not.

Ho2₉: For fourth-grade science, there is no significant two-way interaction between gender and attendance in a preschool program.

For fourth-grade science achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant, $F = (1, 84) = .05, p = .83$. The null hypothesis for the interaction term was retained. There was no significant difference in the science achievement test scores between fourth-grade students who attended a preschool

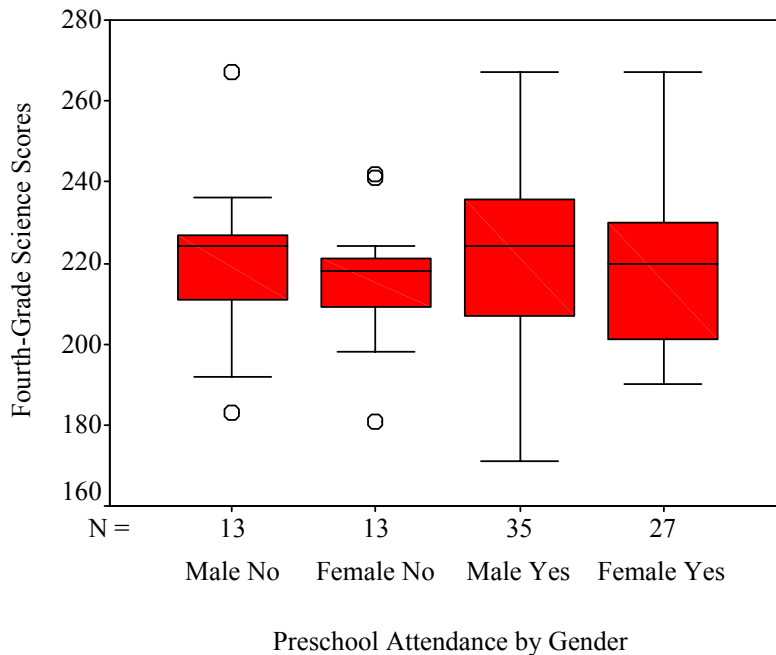
program and those who did not, $F(1, 84) = .20, p = .66$. The effect size for attendance in a preschool program was small ($<.01$). The science achievement test scores mean for fourth graders who did not attend a preschool program ($M = 217.88, SD = 18.34$) was almost identical to the mean of fourth-grade students who attended a preschool program ($M = 220.23, SD = 21.30$). Likewise, there was no significant difference in the science achievement test scores between male and female fourth-grade students, $F(1, 84) = .72, p = .40$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($.01$). The science mean for boys ($M = 221.25, SD = 22.06$) was only slightly higher than the mean for girls ($M = 217.48, SD = 18.27$). Table 9 shows the means and standard deviations for fourth-grade science achievement test scores by attendance in a preschool program and gender.

Table 9

Means and Standard Deviations for Fourth-Grade Science Scores by Preschool Attendance and Gender

Attended Preschool	Gender	<i>N</i>	<i>M</i>	<i>SD</i>
No	Male	13	220.46	20.47
	Female	13	215.31	16.34
	Did Not Attend Total	26	217.88	18.34
Yes	Male	35	221.54	22.90
	Female	27	218.52	19.34
	Attended Total	62	220.23	21.30
Gender	Male	48	221.25	22.06
	Female	40	217.48	18.27
	Population Total	88	219.53	20.40

Figure 7 shows the boxplot for science achievement test scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range
 * = an observation more than 3.0 times the interquartile range

Figure 7. Boxplot for Fourth-Grade Science Scores by Attendance in a Preschool Program and Gender

The following hypotheses were tested concerning fourth-grade social studies:

Ho2₁₀: There is no difference in the fourth-grade social studies achievement test scores between boys and girls.

Ho2₁₁: There is no difference in the fourth-grade social studies achievement test scores between those who attended a preschool program and those who did not.

Ho2₁₂: For fourth-grade social studies, there is no significant two-way interaction between gender and attendance in a preschool program.

For fourth-grade social studies achievement test scores, the two way interaction between gender and attendance in a preschool program was not significant $F(1, 84) = .51, p = .48$. The null hypothesis for the interaction term was retained. There was no significant difference in social studies achievement test scores between fourth-grade students who attended a preschool

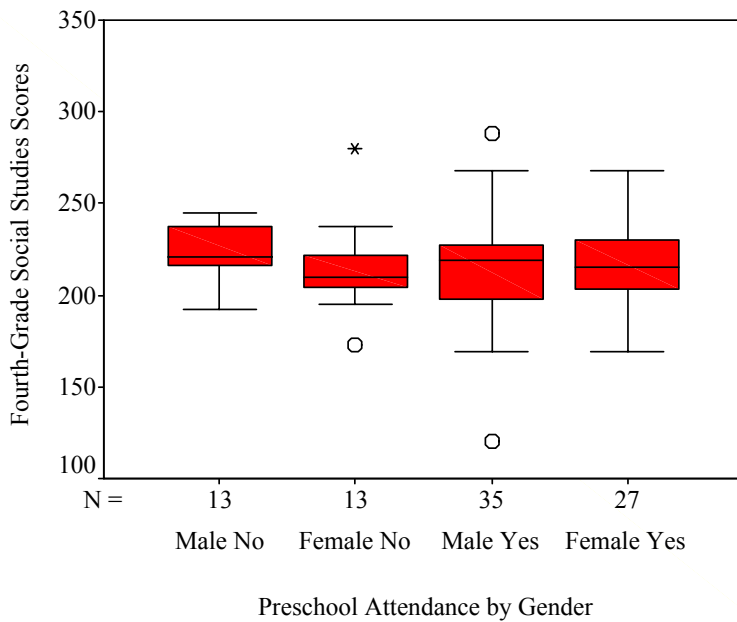
program and those who did not, $F(1, 84) = .62, p = .43$. The effect size for attendance in a preschool was small (.01). The social studies achievement test scores mean for fourth graders who did not attend a preschool program ($M = 219.31, SD = 21.67$) was almost identical to the mean of fourth-grade students who attended a preschool program ($M = 214.60, SD = 26.28$). Likewise, there was no significant difference in social studies achievement test scores between male and female fourth-grade students, $F(1, 84) = .34, p = .56$. Therefore, the null hypothesis for gender was retained. The effect size for gender, as measured by η^2 , was small ($< .01$). The social studies mean for boys ($M = 216.67, SD = 27.07$) was slightly higher than the mean for girls ($M = 215.18, SD = 22.54$). Table 10 shows the means and deviations for fourth-grade social studies achievement test scores by attendance in a preschool program and gender.

Table 10

Means and Standard Deviations for Fourth-Grade Social Studies Scores by Preschool Attendance and Gender

Attended Preschool	Gender	N	M	SD
No	Male	13	223.15	17.53
	Female	13	215.46	25.28
	Did Not Attend Total	26	219.31	21.67
Yes	Male	35	214.26	29.70
	Female	27	215.04	21.61
	Attended Total	62	214.60	26.28
Gender	Male	48	216.67	27.07
	Female	40	215.18	22.54
	Population Total	88	215.99	24.98

Figure 8 shows the boxplot for the social studies scores by preschool attendance and gender.



o = an observation between 1.5 times to 3.0 times the interquartile range

*** = an observation more than 3.0 times the interquartile range

Figure 8. Boxplot for Fourth-Grade Social Studies Scores by Attendance in a Preschool Program and Gender

Further data were discovered that subdivided the ANOVA and these data did not validate the results of the ANOVA. The number of students included in each category by grade level and subject field were so small that the use of statistical tests of significance would violate the rules for using these tests.

Careful summary and interpretation is necessary to provide meaningful conclusions, summary of findings, and recommendations. These are presented in Chapter 5.

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This study was completed to determine if a difference in achievement test scores existed between students who attended preschool and those who did not as measured by standardized achievement test scores of students in the third and fourth grades. The variables of grade level and gender were also considered. A summary of the findings are presented along with conclusions and recommendations for future research.

Summary of the Study

Implementation of preschool programs nationwide has increased over the past 3 to 4 years. This focus has been linked primarily to studies that have been conducted to determine the effectiveness of preschool programs on students' achievement. The growing body of research has revealed both positive and negative effects on implementation of preschool programs. Additionally the accuracy of much of the research has been questioned.

The review of literature traced the history of the implementation of preschool programs within the United States. Information was presented beginning with the inception of preschools in 1838 to research started in the 1970s and up to the recent focus on assessing the implementation of preschool programs within public schools.

A review of research studies focusing on preschool programs and their overall affect on achievement, retention, special education referrals, dropout rates, attendance, higher employment rates, fewer arrests, and cost effectiveness was presented. Maeroff (2007) focused on the limitations of universal preschool programs. He stated that a challenge for universal prekindergarten will be to find places for the vast number of Americans in the economic middle, especially the near poor who do not qualify for Head Start and cannot afford unsubsidized nursery schools. Conversely, according to *Education Daily* ("Investing in Early Education Pays

Off,” 2005), school officials in Wisconsin have considered the long-term cost effectiveness of quality preschool programs and have determined that schools in Wisconsin would save 68 cents for every dollar they invested in the education of 4-year olds (p. 1). Using these cost estimates from the Wisconsin Department of Public Instruction and with existing savings projections, the report showed that Milwaukee would save 76 cents for every dollar invested in high-quality programs for 4-year olds because of reductions in special education and grade retention. However, Barnett (2005) pointed out in his study by the National Institute for Early Education Research at Rutgers University, that there was strong evidence that quality public preschool programs produced broad gains in children’s learning and development. Cotton and Conklin (2001) have also evidenced links to preschool participation and its long-term effects. According to Cotton and Conklin, preschool graduates outshone nonparticipants in several ways. They had:

1. fewer referrals for remedial classes or special education;
2. fewer retentions;
3. higher grades;
4. greater social and emotional maturity;
5. more frequent high school graduation/GED completion;
6. greater academic motivation, on-task behavior, capacity for independent work, and time spent on homework;
7. lower incidence of absenteeism/detentions;
8. better attitudes toward school;
9. better self-esteem, greater internal locus control;
10. lower incidence of illegitimate pregnancy, drug use, and delinquent acts;
11. more sports participation; and
12. higher future aspirations and more postsecondary education. (p. 5)

Once out of school, according to Cotton and Conklin, young people who had attended preschool continued to make a better showing in life than those who did not attend. Adults who had attended preschool were found to have:

1. higher employment rates and better earnings and, correspondingly, a lower incidence of dependence on welfare;
2. fewer arrests and antisocial acts; and
3. better relationships with family members, a higher incidence of volunteer work, and more frequent church attendance. (p. 6)

In a recent study ("Investing in Early Education Pays Off," 2005), researchers collected data on 5,071 preschool and kindergarten children in 1,320 classrooms during the fall of 2004. Their findings were:

1. Children who attended state-funded preschools showed vocabulary score gains about 31% greater than did children without such programs. This represented an additional 3 months' progress in vocabulary growth at age 4. This measure is strongly predictive of general cognitive abilities and later reading success.
2. State-funded preschool increased children's gains in math skills by 44%. Skills tested included basic number concepts, simple addition and subtraction, telling time, and counting money.
3. State-funded preschool produced an 85% increase in print awareness. Children who attended a state-funded preschool program before entering kindergarten knew more letters, letter-sound associations, and were more familiar with words and book concepts. (p. 2)

Researchers such as Barnett and Boocock (1998) did not conduct studies that comprehensively examined these and other representations until recently; however, such studies would enhance understanding of how to strengthen the maintenance of the long-term gains.

Reynolds et al. (2003) stated:

1. Most of the evidence for the link between preschool participation and long-term effects on well being came from model programs rather than established, large-scale programs run by human service agencies and schools. Evidence from the large-scale programs established that they have been necessary to assess the effectiveness of state and federal programs.

2. Few studies have demonstrated the cost-effectiveness of early intervention and no studies of large-scale public programs have investigated cost-effectiveness. Identifying programs that provide the greatest returns to society should be a high priority.
3. Components that produce long-term effects are not well understood. Researchers have not conducted studies that have comprehensively examined these and other representations until recently; yet such studies would enhance understanding of how to strengthen the maintenance of the long term gains. (p. 634)

A problem with prekindergarten has been uneven access. Families at the far ends of the economic spectrum have been more likely to enroll children in early education. The poorest have had federally funded Head Start, although it has reached barely half the eligible children. Affluent families have had money to send their children to private nursery schools. A challenge for universal prekindergarten will be to find places for the vast number of Americans in the economic middle, especially the near poor who do not qualify for Head Start and cannot afford unsubsidized nursery schools (Maeroff, 2003). Maeroff also stated that one rationale for universal prekindergarten involved the wish to throw a wider net than that of Head Start, which began as a weapon in the War on Poverty and never grew into the entitlement program it was intended to become.

Therefore, future research should be considered by schools and human service agencies to determine the overall effect on cost, education, and long-term success.

Although much of the current research as documented by *Education Daily* ("Investing in Early Education Pays Off," 2005) has indicated a positive impact from attendance in quality preschool programs, the inability to generalize this information necessitates evaluation studies at the local level to make responsible and educationally sound decisions.

Summary of Findings

The findings of this study were contradictory to many of those presented in the review of literature. Although the findings provided answers to the original research questions, they did

not concur with those of other researchers. The following is a restatement of each research question and a summary of the findings related to it.

Research Question #1

Are there differences in third-grade achievement test scores for language arts, math, science, and social studies based on (a) gender, (b) attendance in a preschool program and (c) interaction between gender and attendance in a preschool program?

For third-grade language arts achievement test scores, the two-way interaction between gender and attendance in a preschool program was not significant. Furthermore, there was no significant difference in the language arts achievement test scores between third-grade students who attended a preschool program and those who did not. Finally, there was no significant difference in language arts achievement test scores between male and female third-grade students.

Findings for third-grade math achievement test scores between gender and attendance in a preschool program were not significant. Likewise, there was no significant difference in the math achievement test scores between third-grade students who attended a preschool program and those who did not. There also was no significant difference in math achievement scores between male and female third-grade students.

Regarding findings for third-grade science achievement scores, there was no significant difference between gender and attendance in a preschool program. In addition, there was no significant difference in the science achievement test scores between third-grade students who attended preschool and those who did not. Furthermore, the achievement test scores in science between male and female third-grade students were not significant.

For third-grade social studies achievement test scores, there was no significant difference between gender and attendance in a preschool program. Likewise, there was no significant difference in the social studies achievement test scores between third-grade students who attended preschool and those who did not. Finally, the achievement test scores in social studies

between male and female third-grade students were not significant. The null hypotheses for gender and attendance as well as the null hypotheses for gender were retained in all four academic areas for third-grade students.

Research Question #2

Are there differences in fourth-grade achievement test scores for language arts, math, science, and social studies based on (a) attendance in a preschool program, (b) gender, and (c) interaction between gender and attendance in a preschool program?

Research findings for fourth-grade language arts achievement test scores indicated that there was no significant difference between gender and attendance in a preschool program. Furthermore, there was no significant difference in the language arts achievement test scores between fourth-grade students who attended preschool and those who did not. In addition, the achievement scores in language arts between male and female fourth-grade students were not significant.

The fourth-grade math achievement test scores indicated there was no significant difference between gender and attendance in a preschool program. Likewise, there was no significant difference in the math achievement test scores between fourth-grade students who attended preschool and those who did not. Finally, the achievement test scores in math between male and female fourth-grade students were not significant.

No significant difference was present between gender and attendance in a preschool program of fourth-grade students in science achievement test scores. Furthermore, there was no significant difference in the science achievement test scores between fourth-grade students who attended preschool and those who did not. In addition, the achievement test scores in science between male and female fourth-grade students were not significant.

Research findings for social studies achievement test scores indicated there was no significant difference between gender and attendance in a preschool program. There was also no significant difference in the social studies achievement test scores between fourth-grade students

who attended preschool and those who did not. Finally, there was no significant difference in the social studies achievement test scores between male and female fourth-grade students.

There is no evidence from the research findings that attendance in a preschool program produces measurable results in third grade or fourth grade on standardized tests. The study also did not indicate that gender or attendance in a preschool program was related to third-grade or fourth-grade *Terra Nova* Scores.

Although the findings did not glean the same information obtained from the literature review concerning preschool attendance and its overall effect on achievement, many of the studies were conducted from model programs rather than established, large-scale programs run by human service agencies and schools. Furthermore, even though the research findings did not show significance, the study sampled only 51.1% of the population.

Conclusions

Upon completing the research, it was evident that no significance was found regarding preschool attendance on achievement scores, gender on achievement scores, and gender on preschool attendance. Although there was no weight apparent concerning preschool attendance attached to achievement scores in this study, as presented in the literature review indicated by Barnett and Boocock (1998) and Jacobson (2001), there was an overall effectiveness regarding preschool attendance to the long-term success of individuals. Furthermore, the difference in those long-term studies and the one presented in this study was the follow up data needed to present the impact of attendance to a preschool program on the sample population regarding the results on the population's success into adulthood. The effectiveness of the Perry Preschool Project and the Abecedarian project were based on model programs rather than a large-scale study from a human service agency or school.

According to Wilson (2000):

The High/Scope Perry Preschool Project has been the focus of an ongoing longitudinal study conducted by the High/Scope Educational Research Foundation of 123 high-risk African American children. Participants were of low socioeconomic status, had low IQ

scores, and were at high risk of failing school. Fifty-eight of these 3-and 4-year-old children were assigned to the program group, and 65 of these children were assigned to a control group that did not go through the program. Children attended the preschool program Monday through Friday for 2.5 hours per day over a 2-year period. During that same period, a staff to child ratio of one adult for every five or six children enabled teachers to visit each child's family in their home for 1.5 hours each week. In addition, parents participated in monthly small group meetings with other parents facilitated by program staff. (p. 2)

Although the Greeneville City school system has some of the advantages listed in the Perry Preschool Project, such as staff to student ratio, there are still some advantages addressed in the Perry Preschool project that are not currently addressed within the overall content of the Greeneville City school system's preschool program such as weekly teacher visits and monthly group meeting for parents facilitated by the school system.

The population in this study has not reached an adequate age and educational level to determine if the associations of the preschool program would show the same outcomes as listed by Cotton and Conklin (2001) in the literature review. According to Cotton and Conklin, preschool graduates outshone nonparticipants in several way. They had:

1. fewer referrals for remedial classes or special education;
2. fewer retentions;
3. higher grades;
4. greater social and emotional maturity;
5. more frequent high school graduation-GED completion;
6. greater academic motivation, on-task behavior, capacity for independent work, and time spent on homework;
7. lower incidence of absenteeism and detentions;
8. better attitudes toward school;
9. better self-esteem, greater internal locus control;
10. lower incidence of illegitimate pregnancy, drug use, and delinquent acts;
11. more sports participation; and
12. higher future aspirations and more postsecondary education. (p. 5)

Once out of school, according to Cotton and Conklin, young people who had attended preschool continued to make a better showing in life than those who did not attend. Adults who had attended preschool were found to have:

1. higher employment rates and better earnings and, correspondingly, a lower incidence of dependence on welfare;
2. fewer arrests and antisocial acts; and
3. better relationships with family members, a higher incidence of volunteer work, and more frequent church attendance. (p. 6)

No firm conclusions could be drawn about the relative merits of (a) nonpreschool attendance, (b) preschool attendance in Greeneville City schools, and (c) preschool attendance in other agencies or school systems. The data could not be validated because of:

1. the lack of sufficient numbers in the various categories;
2. the lack of data about national and ethnic origin of the students in grades three and four;
3. the lack of data about third- and fourth-grade students' first and second language;
4. the lack of data concerning the origin of the families of students in grades three and four;
5. the lack of data concerning the socioeconomic status of students in grades three and four;
6. the lack of data about whether each child in grade three or four attended kindergarten; and
7. the lack of data concerning the academic performance of the currently studied children in second grade and longitudinal extension of the study through high school in terms of GPAs, ACT and SAT scores, graduation rates, and college attendance rates.

Recommendations for Future Study

Several recommendations for future research were prompted by this study. A long-term study as to the effectiveness of preschool attendance would be beneficial based on data obtained in the literature review.

Although this study did not determine a difference between preschool attendance and nonattendance regarding achievement test scores, it would be feasible to follow the population in this study to determine if preschool attendance does indeed affect long-term success. Based only on a little more than half of the population, the findings do not give a true indication as to the overall effect of preschool attendance concerning students within the Greeneville City school system.

The Greeneville City School system does not presently ask parents about pertinent information regarding preschool attendance during the registration process. If this information were made available, it could be logged into a database program that would allow the school system to have the ability to follow students throughout their attendance and determine the effectiveness of any programs that have been implemented during their educational process. In addition, this would give a more true indication of the results of preschool intervention. This database could, as well, allow school officials to follow students demographically by family origin, ethnic origin, primary language, retentions, special education referrals, dropout rates, graduation rates, ACT and SAT scores, socioeconomics, and by attendance in kindergarten.

Preschool- through 12th-grade educators in Tennessee have concluded that the Tennessee Comprehensive Assessment Program's categories of "Advanced Proficient" and "Proficient" overstate the achievement of Tennessee students. In my previous experience as the Title I supervisor for my school, the percentile rank for "Proficient" as determined on the Tennessee Comprehensive Assessment Program, was a score at or above the 25th percentile. In previous years, before "Proficiency" was used as a category, students with scores below the 50th percentile rank were able to qualify for Title I services within Tennessee schools under the Target Assisted Title I school label. The Title I label is obtained from the percentage of students on the free- and

reduced-price meals program as reported by each school to the State of Tennessee. The National Assessment of Educational Progress scores however show that Tennessee is behind the national average in math by six points, language arts by two points, and science by two points (National Center for Education Statistics, 2008). Of the elementary schools assessed, 50% had the label Title I School, and one of the other schools within this system was considered a Target Assisted Title I School.

A study should also be conducted to determine which academic areas on the standardized tests showed the most gains for those students who did attend a preschool program. A study of this type would allow educators within the Greeneville City school system to determine which academic areas are in most need of improvement based on the Tennessee Comprehensive Assessment Program obtained yearly from the state department of education.

The results of this study were not anticipated based upon the literature review; however, the study proved beneficial overall because of the knowledge gained in regard to what components constitute a successful and well-planned preschool program. Because of continued focus from governmental agencies on preschool attendance, research on preschool programs will continue to be at the forefront of all local, state, and national government policies.

Recommendations for Greeneville City School System's Preschool Program

After analyzing the data, it became apparent that the Greeneville City school system's preschool programs would benefit from continued data analysis. The Greeneville City school system's preschool program would also profit from a follow-up study on academic performance of students in second grade, a longitudinal extension of this study through high school in terms of students' special education referral rates, truancy rates, grade-level retention (failure) rates, grade-point averages, nationally standardized test scores, such as those on the Academic College Test (ACT) and the Scholastic Aptitude Test (SAT), high school graduation rates, and college entrance rates. Several other suggestions regarding further studies became apparent based on the findings:

1. This study should be replicated to include data concerning national and ethnic origin of the students;
2. This study should be replicated to include data concerning third-grade and fourth-grade students' first and second language;
3. This study should be replicated to include data concerning the origin of the families of students in third and fourth grades;
4. This study should be replicated to include data concerning the socioeconomic status of the students in third and fourth grades; and
5. This study should be replicated to include data on whether each child in third and fourth grade attended kindergarten.

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APPENDICES

APPENDIX A

Questionnaire for Parents

My name is Anita Conner, an employee of the Greeneville City School System. I am conducting a research project for East Tennessee State University in accordance with a doctorate in education degree. The following questionnaire was developed to determine how many students have attended a preschool program in the past, who are now in fourth or fifth grade within the Greeneville City Schools. My hope is to prove that students who have attended a 4-year-old program before entering kindergarten have made more academic progress than those who did not attend a 4-year-old program. This study can prove beneficial for funding of future 4-year-old programs within the Greeneville City Schools and possibly prove how beneficial these programs are for the growth and academic development of students. Your completion of this form will mean you have agreed to participate in this study.

Questionnaire for Parents of Fourth or Fifth Graders In the Greeneville City School System

1. Name of child: _____
2. Gender of Child: _____ Male
_____ Female
3. Grade your child is in: _____ Fourth
_____ Fifth
4. School attended:
_____ EastView _____ Tusculum View
_____ Hal Henard _____ Highland
5. Race/Ethnicity:
_____ Hispanic _____ White
_____ Asian _____ Black
_____ Other

6. How many children in your household are in the fourth or fifth grade within the Greeneville City School System?

_____ One

_____ Three

_____ Two

_____ Four or More

7. Did your child or children ever attend a preschool program for four-year-olds?

_____ Yes

_____ No

8. If the answer is "yes" to number 7, please provide the name of the preschool program that your child/children attended?

9. Has your child maintained continuous enrollment in the present school since entrance to kindergarten?

_____ Yes

_____ No

10. If the answer is "no" to number 9, how many schools has your child/children attended during their school career?

_____ One

_____ Three

_____ Five or more

_____ Two

_____ Four

Thank you for completing the questionnaire.

Sincerely,

Anita Conner

APPENDIX B

Greeneville City School System's Grant

Goals of the Program

The Greeneville City School System has been aggressively pursuing partnerships and funding to expand preschool services for at-risk children in Greeneville. The need for adequate preschool education is nationally recognized. Richard Riley, in his recent address at the Early Childhood Summit, stated that, because of current findings in brain research and reading readiness, it is absolutely imperative that we place powerful and sustained focus on the early years. The State of Tennessee's Master Plan reflects this focus; goal number one is that all children will start school ready to learn. Greeneville City Schools' vision that all children will learn the essentials for happy and productive lives is supported by the belief, "be champions for children" and by the Board Goal, "to continue emphasis on meeting the early childhood needs of young children".

A Goals 2000 grant was secured for the establishment of a preschool program at Highland Elementary School, a school-wide Title I school, in 1999/2000. Because this funding was for one year only, resources are being sought to continue this program for the 2000/2001 school year. Consultation with the administrators of Head Start in our region is underway, and the initial steps for establishment of a partnership have been agreed to by both agencies. This partnership will allow us to provide high quality preschool services to at-risk city children. It is anticipated that a minimum of two collaborative Head Start classes will be needed by 2001/2002.

These programs are intended to address the needs of at-risk preschoolers. The programs will provide early detection and prevention strategies that will contribute, not only to school success, but also to success beyond school as demonstrated in the recently released Abecedarian Study. This research shows that, at age 21, those students who received early intervention were more likely to be enrolled in or graduated from a 4-year college, delay parenthood, and be gainfully employed.

Identification of Need

Greeneville City Schools presently serves a population that consists of approximately 30% free and reduced lunch eligible children. Many of these students are not served by quality preschool programs. Highland served an average of sixteen students during the 1999/2000 school year, and Head Start served 39 children from Greeneville last year. Based on current enrollment, fifteen Head Start eligible children are attending kindergarten this year who did not attend Highland Preschool or Head Start last year. Additionally, there are children who do not meet Head Start's eligibility requirement but who would meet the accepted criteria for at-risk. Our hope is that, by the expansion of services in Greeneville, more of these students will receive the benefits of quality preschool.

There is also test data to support the need for expanded preschool services in Greenville:

Demonstration of Need Based on Kindergarten Brigance Scores

Average Score Systemwide	Average Score for Poverty-Level Children Enrolled in Preschool	Average Score for Poverty-Level Children Not Enrolled in Preschool
92.38	89.27	73.50

Identification of Target Population

The process for identifying these at-risk youngsters would include utilization of Child Find and communication with other referral agencies:

- Department of Children's Services
- Families First
- Greenville Housing Authority
- Local pediatricians
- Greene County Health Department
- Family Resource Center
- Backyard Learning Center
- Success by Six
- Infant Toddler Program (early intervention)

Additionally local media will be employed to inform the community of upcoming preschool registration. Flyers will be posted and distributed in areas of federal or low-rent housing. Eligibility will be assessed based on the point system used by Head Start. First priority will be given to students with the most need.

Grant Plan

Staffing and Parent Involvement: Each preschool classroom will be staffed with a certified preschool teacher and with sufficient assistants to provide adult

child ratios of 1:10 for four-year-olds and 1:8 for classes consisting of more than 50% three-year-olds. Additionally, assistants will be utilized to provide full day (6:00 am to 6:00 pm) care and full year (260 days) care. A social worker will be employed to provide liaison services between parents and social service agencies in the community. This worker will also maintain contact with parents, providing information and training as needed. No educational investment provides a higher return than increased family involvement. Parent involvement has been shown consistently to improve student achievement. These preschool programs will use a plan developed by the Appalachian Educational Laboratory (AEL). A resource booklet entitled The ABC's of Parent Involvement in Education: Preparing Your Child for a Lifetime of Success will be used for monthly parent/guardian group discussion sessions. In addition to discussions of effective parenting, partnering agencies will provide guest speakers to provide parents with needed information. During home visitations Family Connections I, an AEL publication will be used to assist the parent/guardian with activities for their children. Partnerships will be developed with Greeneville City Schools' Adult Basic Education program to provide classes and training for parents as needed.

Staff Development: Teachers and assistants will be provided generous opportunities to participate in staff development activities. Greeneville City Schools places a strong emphasis on staff development as evidenced by our staff development plan and commitment of significant budget dollars. Major emphases

will be: 1. for assistants who do not hold CDA, AA, or AAS in Early Childhood to achieve this certification, and 2. to achieve accreditation for the programs from the National Association for the Education of Young Children (NAEYC). Staff will be afforded opportunities to attend NAEYC and/or TAEYC conferences and ETSU's Early Childhood Conference. Membership to the NAEYC will also be provided all staff.

Educational Program: The learning program will address all areas of the child's development, cognitive, physical, emotional, social, and communication. The program will provide learning experiences in each developmental area and be delivered in an integrated fashion, which provides daily active learning through exploration and play. In conjunction with guidelines provided by the NAEYC, the program will provide a balance of activities, from vigorous outdoor play to quiet indoor play, individual and small group activities, and will focus on activities that are child initiated as opposed to teacher directed.

The program will incorporate basic reading readiness skills to prepare the student for a successful academic future. Technology will be an integrated part of the preschool program. Computers in the classroom will deliver a managed curriculum via Computer Curriculum Corporation's courseware, SuccessMaker. Other developmentally appropriate software will also be utilized. Contract services in the areas of speech, OT, and PT will be available as needed. In addition to the regular class instruction, at Highland Learn and Grow Academy (because it is

housed in an elementary school), specialist programs such as music, art, physical education, and library will be available on a weekly basis.

Transition and Collaboration: Children's entry into the program will be facilitated in a number of ways. The teacher will visit the homes of these students prior to the start of school. Children and their parents or guardians will be invited to visit the school prior to enrollment, and students will be placed on a staggered schedule at the beginning of the year.

These preschool programs will be fully articulated with kindergarten programs in Greeneville City Schools. Our system is in the fourth year of curriculum mapping. Kindergarten maps as well as dialogue with kindergarten teachers will provide preschool teachers with information necessary to design a program that will adequately prepare the children for expectations at the kindergarten level.

Greeneville City Schools has developed a collaborative partnership with Head Start to provide enhanced services to at-risk preschoolers. Head Start has agreed to provide capital improvements to the existing facility, a handicap-accessible preschool playground, and existing assistants. Greeneville City Schools will provide certified preschool teachers for the program. As previously stated, it is our intent to expand this program to two classrooms in the 2001/2002 school year.

Other agencies that will collaborate with Greeneville City Schools in serving at-risk preschoolers include:

- Families First (Kim Gass) - referrals, integrated activities, publicity
- Tennessee Department of Labor and Workforce Development Division of Adult Education (Kim Gass) - classes for parents including: Basic Skills Instruction, GED, Employability Skills Training, Computer Literacy, ESL, and Family Literacy
- Walter's State Community College and East Tennessee State University, in conjunction with Families First (Kim Gass and Jeff Horner - volunteers to work with both students and parents
- Greeneville Housing Authority (Nancy Fortner) - referrals, publicity
- Department of Children's Services (Linda Evans) - social services, referrals, publicity
- Greene County Health Department (Jackie Neas) - referrals, public health services, immunizations and other preventative care
- Greeneville Greene County Literacy Council (Janie Laws) - materials, school supplies, volunteers
- School Nutrition Program (Becky Yonz) - nutrition education, food service
- University of Tennessee Agricultural Extension Agency (Barbara Holt) - nutritional analysis, meal planning

Program Evaluation: The teacher will complete the Brigance Pre-school

Screening (pre-post) for each student. All students are expected to make gains. In addition to this formal means of assessment, teachers will perform informal, formative assessments throughout the year in order to provide a program specific to the needs of each child. The Kindergarten Screening Team will administer the Kindergarten Brigance Screening to the students in June of each year. Ninety-five

percent of the students will be expected to score at or above the system average. Achievement test scores for these students will be tracked as they move through school. Their percentile rank as well as gain scores will be compared to state and system averages.

At the end of the first term 90% of the students will have the ability to operate a computer mouse and headsets, log on to the computer, and complete computer skills lessons using the SuccessMaker courseware. Preschool staff will use a checklist to record each student's progress. Gain reports on the CCC courseware, Reading Readiness and Math Concepts & Skills will be monitored. At the end of the year eighty percent of the students will be expected to have made at least one year's gain in each course. Time students spend using this courseware will also be monitored via CCC course reports. It is expected that each child will average 30 minutes each day (15 minutes for reading activities and 15 minutes for math).

Eighty percent of the preschool parents or guardians will become active participants in their child's education. This will be measured by participation at monthly group sessions, parent participation on field trips, and parents as school volunteers. Student attendance is expected to be 95%. A log of home visits and contact by the parent liaison will be maintained. A minimum of two home visits per semester is expected. A checklist of books parents read to students will also be maintained. Fifty percent of the parents will be expected to have read at least 25

books to their children at home. This information will be monitored by the parent liaison during home visits or other regular contact. Richard Riley believes that we can "revolutionize American education if we can get parents and other caregivers to read to a child 30 minutes each day".

In addition to evaluation and tracking of student achievement in the system Matrix, the overall program will be evaluated. Customer satisfaction surveys will be distributed to all parents to give them an opportunity to provide feedback with regard to services provided. The parent liaison will assist in completion of these forms if necessary. An advisory team consisting of parents, preschool and kindergarten teachers, and representatives from partnering agencies will be formed to guide the programs in continuous improvement. All available assessment information will be used to prepare a report to the Greeneville City Board of Education illustrating the programs' effectiveness.

Summary

Recent findings on early brain development confirm that the critical foundations for learning and school achievement are laid well before public schooling traditionally begins. In order to achieve our vision for children, it is crucial for Greeneville City Schools to establish preschools that address this need area. The high correlation of poverty and substandard preschool is well established in research, and kindergarten teachers report that this deficit is becoming more and more evident.

ZERO to THREE, a leading organization that focuses on early child development notes researchers have found that children who attend high-quality early childhood programs gain skills associated with greater brain development. They also gain other kinds of competencies such as self-control and a greater motivation for learning. Families benefit too as they access needed services, develop parenting skills, and participate in an atmosphere that promotes meaningful family involvement.

Nationally, Head Start serves only 40 percent of eligible children. For this reason it is imperative that we partner with Head Start to reach as many at-risk youngsters as possible. The Child Care Action Campaign reports that, "when the impetus for these partnerships comes from within the school system, the chances of success and sustainability are greater". Greeneville City Schools is committed to excellence in education; to achieve excellence we must ensure that all students come to school ready to learn.

APPENDIX C

Letter From Director of Schools



Greeneville City Schools

312 Floral Street
P.O. Box 1420
Greeneville, TN 37744-1420
Phone: 423/787-8000
FAX: 423/638-2540

Director of Schools
Dr. Lyle C. Ailshie

**Assistant Superintendent
for Administration**
Robert "Eddie" Jordan

**Assistant Superintendent
for Instruction**
Dr. Vicki C. Kirk

**Director of
Special Programs**
Stephen H. Long

**Director of
Technology Systems**
Beverly S. Miller

**Business and
Finance Manager**
Lisa O. Stephens

Board of Education

Chairperson
Ray Smith

Vice Chairperson
Jerry Anderson

Treasurer
Craig Ogle

Board Member
Cindy Luttrell

Board Member
Dr. Mark Patterson

January 24, 2005

Educational Leadership & Policy Analysis
East Tennessee State University
Johnson City, Tennessee

Re: Dissertation Topic Approval of Mrs. Anita Conner

To Whom It May Concern:

I am writing to inform the doctoral committee of Mrs. Anita Conner that she has discussed her desired dissertation topic with me and I have approved the study. She would like to do a longitudinal study to determine the impact of students' attendance in the Greeneville City School System's preschool program on later academic performance.

Mrs. Conner's proposed study is not only seen as a legitimate doctoral study, it would also be of significant value to the school system. We currently have anecdotal evidence of the value of participating in a preschool program, but to have empirical evidence would enhance our efforts to expand the program.

I ask that you approve Mrs. Conner's request. If additional information is needed, or if there are questions, do not hesitate to contact me.

Sincerely,

A handwritten signature in dark ink, appearing to read "Lyle C. Ailshie".

Lyle C. Ailshie
Director of Schools

*"Only the best . . .
but getting better"*

APPENDIX D

IRB Approval for Study



East Tennessee State University

Office for the Protection of Human Research Subjects • Box 70565 • Johnson City, Tennessee 37614-1707 • (423) 439-6053
Fax: (423) 439-6060

APPROVAL Initial Exempt Review

August 10, 2007

Anita Conner
720 Friendship Rd. N.
Afton, TN 37616

Re: Investigation of the Association Between Attendance in Preschool Programs and Achievement of Elementary School Students in Greenville Tennessee

IRB#: c07-018e

ORSPA #: None

The following items were reviewed:

- Form 103
- Narrative (8/8/2007)
- CV
- Conflict of Interest Form (no potential conflict of interest identified)
- Questionnaire
- Permission Letter from Greenville Director of Schools

On August 9, 2007, a final approval was granted in accordance with 45 CFR 46. 101(b)(2). It is understood this project will be conducted in full accordance with all applicable sections of the IRB Policies. No continuing review is required. The exempt approval will be reported to the convened board on September 6, 2007.

Make sure you provide the Graduate Office with a copy of this letter for their records.

Unanticipated Problems Involving Risks to Subjects or Others must be reported to the IRB (and VA R&D if applicable) within 10 working days.

Proposed changes in approved research can not be initiated without IRB review and approval. The only exception to this rule is that a change can be made prior to IRB approval when necessary to eliminate apparent immediate hazards to the research subjects [21 CFR 56.108 (a)(4)]. In such a case, the IRB must be promptly informed of the change following its implementation (within 10 working days) on Form 109 (www.etsu.edu/irb). The IRB will review the change to determine that it is consistent with ensuring the subject's continued welfare.



Sincerely,

A handwritten signature in black ink, appearing to read 'Andrea Clements', with a long, sweeping horizontal line extending to the right.

Andrea Clements, Ph.D., Chairperson
ETSU Campus Institutional Review Board

VITA
ANITA MARIE CONNER

Personal Data: Date of Birth: June 21, 1966
 Place of Birth: Atlanta, G.A.
 Marital Status: Married

Education: Tusculum College, Greeneville, Tennessee;
 Elementary-Special Education, B.S.; 1989

 Tusculum College, Greeneville, Tennessee;
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 East Tennessee State University, Johnson City, Tennessee;
 Educational Leadership and Policy Analysis, Ed.D.;
 2008

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Experience: Resident Program Specialist, Greene Valley Developmental Center,
 Greeneville, Tennessee;
 1990-1992

 Resource Teacher, Fairview Marguerite,
 Morristown, Tennessee;
 Fall, 1993-1994

 Resource Teacher, Hal Henard Elementary School,
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 Spring, 2007-Present